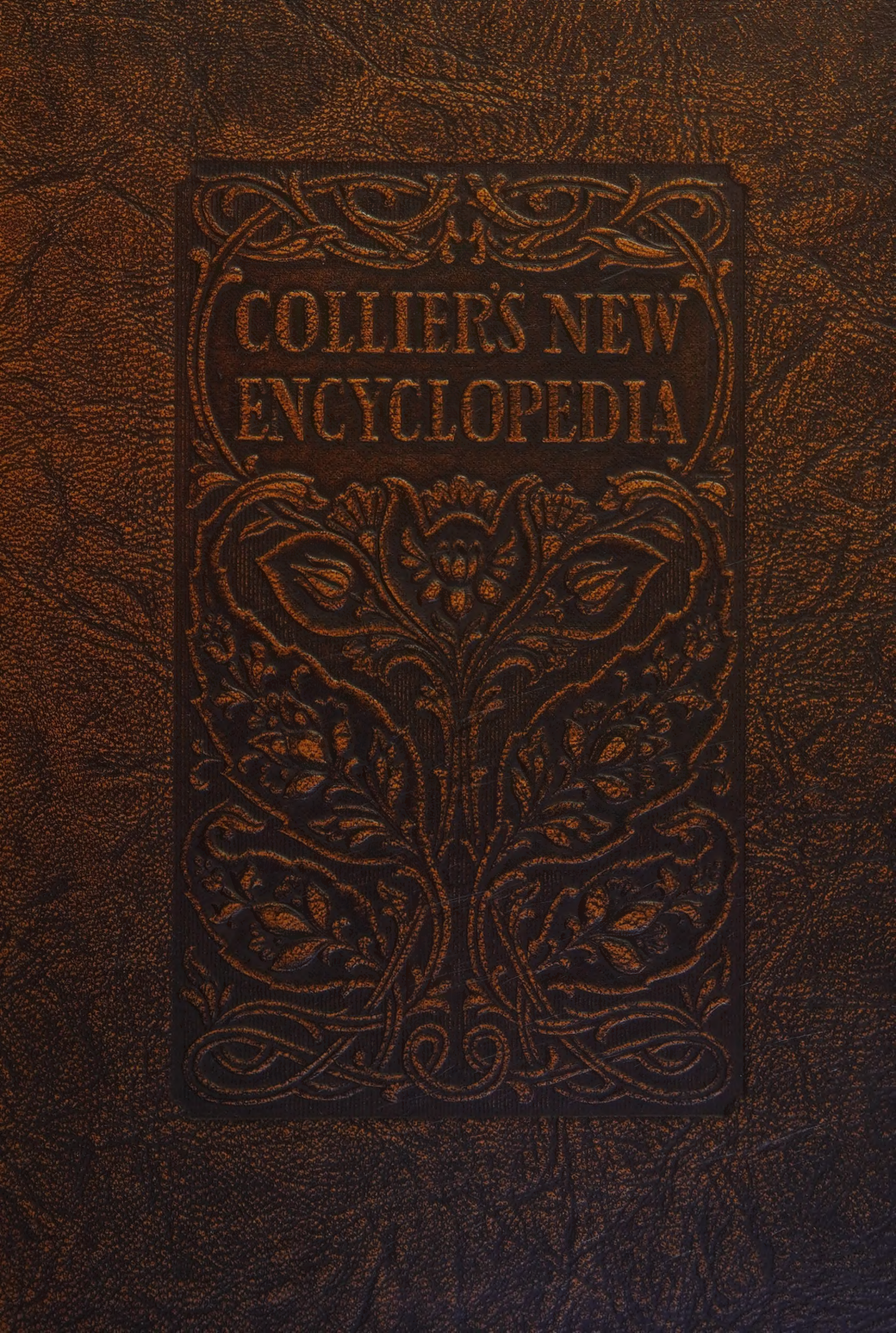
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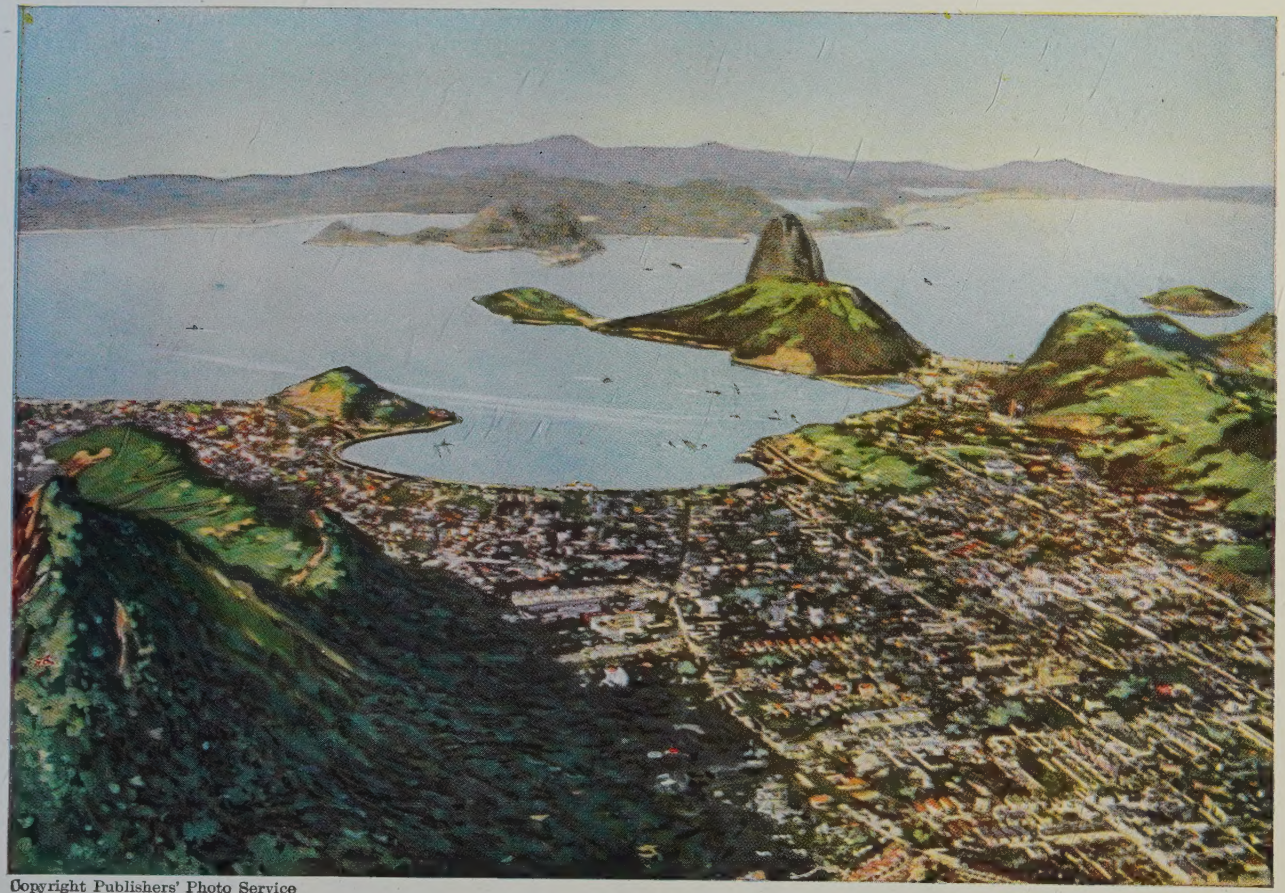

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The capital of Brazil, on the west side of the Bay of Rio de Janeiro, a landlocked bay which affords a wonderful harbor as well as magnificent scenery.

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A LOOSE-LEAF AND SELF-REVISING
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IN TEN VOLUMES WITH 515 ILLUSTRATIONS
AND NINETY-SIX MAPS

VOLUME EIGHT

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"RESP—SOVIET"

RESPIRATION, a part of the life of all organisms, animal and vegetable. It is a series of chemical changes, the first of which is the absorption of oxygen into the body, and the last of which is the excretion of carbonic acid. The association of this intake of oxygen and excretion of carbonic acid with the same organs, the lungs, is due to the fact that both the food stuff and the waste stuff are gases, and not to any immediate connection between them. Necessarily any organ adapted to the diffusion of a gas from the air into the blood must also be adapted for the diffusion of a gas from the blood into the air; that is, supposing that the living membrane, of which the lung essentially consists, which separates the air from the blood, acts, so far as the diffusion of gases is concerned, as a dead membrane; even if it has any effect arising from the fact of its being a living membrane it is probable that it will behave in a similar way to both the ingoing and outgoing gases. The respiration of plants comes under the head of vegetable physiology, and the general relation of the function of respiration to the other bodily functions, under physiology.

In all animals in which the parts of the body are nourished by the circulation of a stream of food material, the blood, there must always be two distinct sets of processes to consider: (1) the maintenance of the blood in a normal state, by the supply of fresh food matter from time to time, and by the elimination of waste matter; (2) the nutrition of the individual tissues and cells of the body by the blood stream. Applying this to the function of respiration, we shall have to consider (1) the manner in which oxygen is supplied to the blood and carbonic acid gas removed from it; (2) the manner in which the cells are able to take oxygen out of the blood and cast into it their useless carbonic acid; also the changes that take place within the cells between the intake of the oxygen and the output of the carbonic acid. These two sets of processes are usually described as the outer and the inner, or tissue, respiration. Some writers include in the term outer respiration the absorption of oxygen by the cells from the blood, and the excretion of carbonic acid into the blood, and restrict the term inner respiration to the actual changes that take place within the cells. It is evident that outer respiration corresponds to the processes of digestion and absorption to which food materials other than gaseous are subjected.

Structure of Respiratory Mechanism.— This mechanism consists of the lungs, a series of minute air chambers with a network of capillaries in the wall, the air passages from the air chambers of the lungs to the outer air, and the chest walls with their muscles, which act like bellows and change the air in the lungs. The essentials of structure that a lung must possess have already been emphasized. The simplest lung that we can imagine would be an elastic membranous bag, well supplied with blood vessels, and with a pipe connecting it with the air; the most complicated that exist are essentially of that construction, the complications that occur having for their object merely the enlarging of the surface exposed to the air. Let us begin with the air passages. There are first the nose and mouth; these join the upper part of the gullet, known as the pharynx. From the pharynx arises the windpipe (trachea); this passes through the voice box (larynx) into the chest cavity; there it divides into two passages (the bronchi); the bronchi go on dividing again and again, generally into two; the ultimate divisions (the bronchioles) open into clusters of air chambers. The air chambers are about $\frac{1}{100}$ inch in diameter. It has been estimated that there are some 725,000,000 of them, and that their total surface is about 2,000 square feet. The walls of the air chambers are formed of a thin membrane in which the blood and lymph capillaries ramify. Minute openings lead from the air chambers into the lymph spaces of the membrane. The membranous walls are partly formed of elastic tissue. It is this that gives to the lungs their elasticity. The larger air passages (trachea and bronchi) are kept open by horseshoe-shaped plates of cartilage; muscles stretch between the poles of the horseshoe, complete the ring, and permit the size of the passages to vary, at the same time resisting over-distention when the internal pressure rises. These larger air passages are lined by a mucous membrane, containing mucous glands; the innermost layer is a ciliated epithelium; the cilia lash upward, and thus keep the passages free from mucus and remove foreign particles. As the passages become smaller they lose their cartilages, and the muscles form a continuous circular layer. The lungs are invested by a membrane (the visceral pleura). At the root of the lungs this membrane is continuous with a membrane which lines the chest cavity (the parietal pleura). The space between the two is the pleural cavity; it is in reality a large lymph space, and communicates with the lymphatics of the pleura. Owing to the air pressure within the lungs the two pleuræ are closely pressed together, the lungs entirely filling the chest cavity.

The ordinary respiratory movements differ in the two sexes and at different periods of life. In young children the

chest is altered in size chiefly by the movements of the diaphragm, and the protrusion of the abdominal wall during inspiration is therefore very marked. In men also it is the diaphragm which is chiefly operative, but the ribs are also moved. In women it is the movement of the ribs, especially the upper ones, which is the most extensive. The respiratory rhythm is the relation of the acts of inspiration and expiration to each other as regards time. The number of respirations in a healthy person is about 14 or 18 per minute; it is greater (nearly double) in childhood. It varies according to circumstances, exercise, rest, health, disease, etc.; in disease it may fall as low as seven or rise to 100.

Though all the muscles concerned in the movements of breathing are voluntary muscles—*i. e.*, can be made to contract by an act of will—yet respiration is normally an entirely involuntary act. This is obvious from the fact that during sleep, or during absence of consciousness caused in any way, respiration goes on as well as during wakefulness. Further, though we may at will breathe or cease to breathe, yet we cannot by any effort of the will suspend the respiratory movements for longer than at most a few minutes at a time.

History.—Aristotle (384 B. C.) thought that the object of respiration was to cool the body. He observed that the warmer the animal the more rapid the breathing, and transposed cause and effect. Galen (A. D. 131–203) experimented on the mechanics of respiration, and knew something of the nervous mechanism. He believed that "soot" and water were excreted from the body by the lungs. Malpighi (1661) described the structure of the lungs. Van Helmont (1664) discovered carbonic acid; Black (1757) observed that carbonic acid is breathed out of the body. Priestley (1774) discovered oxygen. Lavoisier (1775) discovered nitrogen, found the composition of the air, and taught that the formation of carbonic acid and water resulted from the combustion that took place in the lungs. Vogel proved the existence of carbonic acid in the venous blood; Hoffman found oxygen in arterial blood. Magnus extracted and analyzed the gases of the blood in both states.

Artificial Respiration.—When death is imminent owing to a cessation of the natural respiration movements, it may sometimes be averted by an imitation of them carried on regularly for some time. The methods fall into three divisions: (1) insufflation, or blowing of air into the lungs, either by the mouth or by means of bellows; (2) manual methods, in which external manipulations of the chest walls are made to effect the entrance and exit of air; (3) electrical stimulation of the respiratory muscles. In all cases where artificial respiration is required every moment is of importance. In Silvester's method the patient is laid on his back on a plane, inclined a little from the feet upward, and the shoulders are gently raised by a firm cushion placed under them, which also throws the head back. The operator then grasps the patient's arms just above the elbows, and raises them till they nearly meet above the head. This action imitates inspiration. The patient's arms are then turned down, and firmly pressed for a moment against the sides of the chest. A deep expiration is thus imitated. In Howard's method the patient is laid on his back with a cushion below the middle. The operator kneels astride his hips, places his hands with fingers spread outward over the lower part of the chest wall, and alternately bends forward, throwing his weight on the chest to imitate expiration, and springs back to allow the elastic recoil of the chest wall to imitate inspiration.

Whatever method be adopted, the movements must be gentle, regularly, and perseveringly carried on, at the rate of from 10 to 15 times in the minute. In all cases, but especially in that of persons apparently drowned, artificial respiration should be conducted in a warm atmosphere, 90° F., or even more if possible, and should be supplemented by warmth applied to the body and by vigorous friction. In other modes of death by suffocation, such as choking or strangulation, the action of the heart may continue longer, and restoration to life be therefore possible after a longer deprivation of air. See DROWNING.

RESPIRATOR, a device for breathing through, worn over the mouth, or the nose and mouth, and secured by a bandage, strap, or other contrivance, to exclude injurious matters, such as smoke or dust, from the lungs, or to change the condition of the air by passing it through medicaments or gauze. Respirators are used by cutlers and other grinders to exclude the dust from the lungs, and also by firemen to prevent suffocation by smoke. Respirators for persons having weak lungs have several folds of fine wire gauze, which being warmed by the expired breath, in turn heats the inspired air.

RESPONDENT, in law, the designation of the party requiring to answer in a suit, particularly in a chancery suit.

REST HARROW, a common European leguminous plant, *Ononis arvensis*, akin to the brooms. It is plentiful in

stiff clay land in some parts, and derives its name from its long and strong matted roots arresting the progress of the harrow. The stems are annual, often woody or shrubby, and hairy; the flowers, mostly solitary, large, and handsome, are of a brilliant rose color. Rest harrow is also called cammock.

RESTIGOUCHE, a river of Canada. It rises in eastern Quebec, flows S. E. into New Brunswick, then E. and N. E. into the Bay of Chaleurs, forming part of the boundary between the two provinces. Its length is about 200 miles.

RESTORATION, a term used in art to indicate the renewal or repairing of paintings, sculptures, buildings, etc., which have been defaced or partially ruined. It includes the retouching of faded and injured pictures, and the replacing of lost limbs or features of antique statues. But in reference to architecture its meaning is broader; it indicates, first, a representation, by picture or model, of a ruined structure restored to its original state; secondly, the rebuilding of dilapidated or fallen portions of an edifice; and thirdly, taking down so-called "debased" work in a composite building, and replacing it by architectural features in harmony with the general style of the ancient edifice. The first attempts to reproduce Gothic work followed on the decay of the Renaissance style of architecture, and constituted the germ of the modern restoration movement, or Gothic revival, as it is generally called. This movement began to work actively about the beginning of the 19th century, and was largely accelerated by a revival of activity in the Established Church of England. An impulse was given to the restoration movement by a society called the Camden Society, and afterward the Ecclesiological Society, which was composed of churchmen and clergy, and started at Cambridge in the year 1840.

The movement produced specialists, of whom Sir Gilbert Scott was the most noted. In his hands was placed nearly every cathedral church in England, as well as a countless number of parish churches. As examples of "restoration" works we may give the N. transept of Westminster Abbey and the W. side of Westminster Hall, nearly the whole of St. Alban's Abbey, the W. front of Salisbury Cathedral (where an attempt has even been made to produce mediæval sculpture), Chester Cathedral, Worcester Cathedral; in fact, not a cathedral remains in England that does not bear marks of the movement. The "restoration" movement spread to Scotland, the Continent, and even to India, but a reaction set in, and later sentiment was in favor of merely keeping in repair all ancient structures.

RESTORATION, THE, in English history a term applied to the accession of King Charles II., in 1660, after the civil war, to the throne of England, after an interregnum of 11 years and 4 months, from Jan. 30, 1649 (when Charles I. was beheaded), to May 29, 1660. In French history, the first restoration begins May 3, 1814, when Louis XVIII. made his entry into Paris under the protection of foreign bayonets, and ended with the return of Napoleon from Elba, March 20, 1815. The beginning of the second restoration is generally reckoned from the battle of Waterloo, June 18, 1815, and terminated on July 29, 1830, with the abdication of Charles X.

RESURRECTION, an expression denoting the revival of the human body in a future state after it has been consigned to the grave. Traces of this doctrine are found in other religions, in Zoroastrianism, and especially in later Judaism, but the doctrine is peculiarly Christian. In the earlier Hebrew Scriptures there is no mention of it. It is not to be found in the Pentateuch, in the Psalms, nor even in the earlier prophecies. It is supposed to be alluded to in Isaiah (xxvi: 19), and in Ezekiel (xxxvii) in the well-known chapter as to the revival of dry bones in the valley of vision; and in the last chapter of Daniel (xii: 2) there is the distinct affirmation that "many that sleep in the dust of the earth shall awake, some to everlasting life, and some to shame and everlasting contempt." There is also a well-known passage in Job (xix: 25–27) which was long thought to refer to the doctrine of the resurrection of the body; but modern criticism denies the validity of this reference. It is therefore not till the later Judaism that the doctrine appears, and it is sometimes said, doubtfully, to have been derived from Persia or elsewhere. In the time of our Lord it had become a formal doctrine of the Pharisees. The general body of the Jewish people seem also to have believed in it; the Sadducees alone disputed it. It appears, in fact, to have become bound up in the Jewish mind with the idea of a future life, so that an argument which proved the one proved the other. It should be added that Mohammedanism cherishes gross beliefs on this head.

It remained for Christ and His apostles to reveal clearly the doctrine of the resurrection of the body, and to connect it with the fact of Christ's own resurrection as its special evidence and pledge. The following may be stated as the main

points involved in the doctrine as revealed in the New Testament: (1) The resurrection of the dead is ascribed to Christ Himself; it will complete His work of redemption for the human race (John v: 21; I Cor. xv: 22 *sq.;* I Thess. iv: 14; Rev. 1: 18). (2) All the dead will be raised indiscriminately to receive judgment according to their works, "they that have done good, unto the resurrection of life; and they that have done evil, unto the resurrection of damnation" (John 1:21–29; I Cor. xv:22; Rev. xx: 12-15). (3) The resurrection will take place at "the last day," by which seems to be meant the close of the present world (John vi:39, 40, xi:24; I Thess. iv: 15).

The Gnostics denied the resurrection of the body, and made the change a purely spiritual one. The Catholic belief was greatly developed by Tertullian, Jerome, and Augustine, who, however, insisted that the resurrection body, though identical with the original one, is a glorified body. A third view, represented in ancient times by Origen, and recently by Rothe, affirms that the spirit must always have a bodily organism, and that the perfected personality necessarily assumes a spiritualized embodiment; in this view resurrection is limited to perfected spirits.

RESURRECTION, CONGREGATION OF THE, a society of Roman Catholic priests founded in Rome in 1836.

RESZKE, EDOUARD DE. See **De Reszke, Edouard.**

RESZKE, JEAN DE. See **De Reszke, Jean.**

RETAINER, a preliminary fee paid to a counsel to secure his services, or rather to prevent the other side from securing them. A special retainer is a fee paid to secure the services of counsel for a particular case. A general retainer is a fee paid to secure a priority of claim on a counsel's services for any cause which the party paying the fee may have for trial.

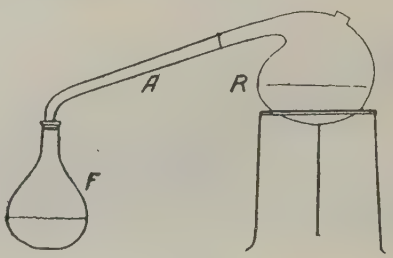
RETAINING WALL, a wall erected to maintain a bank of earth in position, as in sunk fences, faces of earthworks, railway cuttings, sea-walls, etc.; strictly speaking, a wall erected to hold an artificial bank in upright or nearly upright position.

RETENTION, in law, a lien; the right of withholding a debt or of retaining property till a debt due to the person claiming this right be duly paid.

RETIARIUS, in Roman antiquities a gladiator wearing only a short tunic and carrying a trident and net, with which he endeavored to entangle and dispatch his adversary, who was armed with helmet, shield, and sword.

RETINA, the net-like expansion of the optic nerve, lying between the black pigment and the vitreous humor of the eye. It is the only part immediately concerned in the act of sensation.

RETORT, a vessel in whose chamber an object is subjected to distillation or decomposition by heat, a neck conducting off the volatile products. The retort of the chemical laboratory is a vessel of



RETORT

A—Adapter. F—Flask. R—Retort.

glass, platinum, porcelain, or other material. It is bottle-shaped, having a long neck attached, in which the products of the distillation are condensed, and from which they pass into the receiver. The retort of the gas works is a cylinder or segment of a cylinder, formed of clay or iron.

RETREAT, a military operation, in which an army retires before an enemy; properly, an orderly march, in which circumstance it differs from a flight. Also a military signal given in the army by beat of drum or sound of trumpet at sunset, or for retiring from exercise or from action. In Church usage, a period of retirement to a religious house, for self-examination, meditation, and prayer. Retreats commonly last either three or seven days, and are conducted by a cleric, who delivers addresses daily. They are in use both in the Roman and among the High Church party, in the Anglican Church.

RETRIEVER, a breed of dog, trained, as the name implies, to find out and bring back any killed or wounded game. The two varieties of retriever differ only in coat; the curly coat should curl closely and firmly all over the body, the wavy coat should fall straight and thick.

RETROGRADE, in botany, a term used of hairs on a plant, and meaning bent back or down.

RETURNING BOARDS, boards formed to canvass votes cast in an election. They were created in some of the reconstructed States a few years after the close of the Civil War, for the purpose of rectifying fraud or violence that might be practiced on the negroes at the polls. In 1868 Arkansas established the first returning board. South Carolina, Louisiana and Florida had similar boards. The result of the presidential election of 1876 depended on the action of these State boards. In Louisiana and in Florida, the boards declared the election of Republican electors. The Circuit Court of Florida, rejecting the report of the board, decided in favor of the Democratic electors, and the Legislatures also authorized the governor to grant them certificates, the result being that three sets of certificates were made out and sent to Washington. The Electoral Commission accepted the Republican returns as the only ones regular in form. In South Carolina, Nov. 22, 1876, the Supreme Court of the State ordered the board not to carry its judicial authority into effect in counting the votes. The board, however, declared in favor of the Republican electors. The various returning boards were successively abolished by the respective State legislatures.

RETZ, RAIS, or RAIZ, GILLES DE, a French military officer, infamous for his crimes; was a Breton of high rank, who distinguished himself under Charles VII. in the struggle with the English, fighting by the side of the Maid of Orleans. He was made Marshal of France in 1420, and soon after retired to his estates, where for over 10 years he is alleged to have indulged in the most infamous orgies, having kidnapped or enticed to his castle as many as 150 children, who were sacrificed as victims to his abnormal cruelty. He was executed at Nantes, Oct. 26, 1440, after trial and confession.

RETZ, JEAN FRANÇOIS PAUL DE GONDI, a French prelate; born in Montmirail-en-Brie, France, in October, 1614. He became coadjutor to his uncle, the Archbishop of Paris; and, after many intrigues, and fighting several duels, he was made Archbishop of Corinth, and cardinal. He conspired against the life of Cardinal Richelieu, and took a prominent part in opposing Mazarin during the minority of Louis XIV. At length Mazarin, who both hated and feared him, imprisoned him in the castle of Vincennes, then at Nantes, whence he escaped, and traveled through Holland, Flanders, and England. In 1675 he wished to give up his cardinal's hat, and retire from the world, but the Pope would not receive it. He was daring, turbulent, and intriguing; and in his "Memoirs" he has drawn his own portrait with considerable skill and impartiality. He died in Paris, Aug. 24, 1679.

REUCHLIN, JOHANN, a German scholar; born in Pforzheim, Baden, Feb. 22, 1455. He studied at Freiburg, the University of Paris, Basel, and elsewhere, and became familiar with Latin, Greek, and Hebrew. He was patronized by several of the German princes, and was engaged on various political missions. From 1502 to 1513 he was president of the Suabian federal court. His opposition to the proposal to burn all Hebrew books except the Bible raised a host of fanatical enemies against him, but did him no harm. In 1519 he was appointed professor at Ingolstadt; in 1521 the plague drove him to Stuttgart. During a great part of his life Reuchlin was the real center of all Greek and Hebrew teaching in Germany. Several of his works had considerable popularity in their time. He sympathized deeply with Luther and the Reformation, but maintained his connection with the Roman Catholic Church to the last. He died near Hirschau, Bavaria, June 30, 1522.

REUNION, formerly BOURBON, an island in the Indian ocean, between Mauritius and Madagascar, 115 miles from the first; area, 970 square miles. Pop. about 174,000. Capital, St. Denis (pop. about 25,000). It was annexed by France in 1649, and is an important French colony, now represented in the French Parliament by one senator and two deputies. It is very mountainous, the Piton des Neiges reaching a height of 10,069 feet, and the Piton de la Fournaise, an active volcano, of 8,713 feet. The soil produces tropical products, sugar being the principal crop. Coffee, cloves and vanilla are also grown. Destructive hurricanes are frequent. There are no natural harbors, but an artificial harbor has been constructed at Pointe des Galets, at the N. W. side of the island.

REUS, a town of Spain; 58 miles S. W. of Barcelona and 4 N. of its seaport, Salou. The prosperity of the place dates from about 1750, when a number of English merchants settled there. It is a busy center of the cotton, silk, and silk ribbon industries, prepares wine, and manufactures soap, brandy, and leather. Pop. about 26,000.

REUSS, a tributary of the Aar in Switzerland, rising on the N. face of

the St. Gothard, flowing N. past Andermatt and Amsteg, between which places its bed lies at the bottom of a wild and narrow gorge, spanned by the Devil's Bridge and other wonders of Swiss road-making, and entering the S. end of the Lake of Lucerne. This it leaves again at its N. end, at the town of Lucerne, and, still going nearly due N., reaches the Aar near Windisch (Aargau). Its length is 90 miles; its basin, 1,317 square miles.

REUSS, the name of two former sovereign principalities of Germany; between the kingdom of Saxony on the E., the Prussian duchy of that name on the N., and Bavaria on the S. From 1666 the possessions of the House of Reuss were divided between the Elder and the Younger lines.

The principality of Reuss-Greiz (the Elder line) was 122 square miles in extent, and had about 75,000 inhabitants. The chief town is Greiz. The principality of the Younger Line was Reuss-Schleiz-Gera. Area, 319 square miles; pop. about 150,000. Capital, Schleiz.

Of both portions the surface is hilly, being traversed by the Frankenwald (Thüringer Wald), whose summits reach upward of 2,000 feet in height. The chief rivers are the Saale and the White Elster, the valleys of which are well cultivated. More than a third of each state is covered with forests; cattle are fattened on the extensive meadows; and woolen, cotton and silk goods are woven.

The reigning prince of each state was a hereditary sovereign, and in each state always bore the name of Heinrich. He was the executive. Reuss-Greiz had a legislative assembly of 12 members, of whom nine were chosen by the people for six years; Reuss-Schleiz-Gera had an assembly of 16 members, of whom 12 were chosen for three years by the people. The two principalities became republics in 1918, and on Apr. 4, 1919, were merged into the People's State of Reuss. In December, 1919, the new state joined with six other smaller states to form the Federated State of Thüringia.

REUTERDAHL, HENRY, an American naval artist, born in Sweden in 1871. He saw the intimate incidents of the Spanish-American War as a correspondent, in which capacity he also served during the World War. The variety of his experience has added notably to his equipment as a marine artist. In 1913 he was attached to the battleship "Minnesota" on the South American cruise and he has had ten paintings hung in the permanent collection at the United States Naval Academy. He was the author of "Needs of the Navy" (1908), which precipitated a Senate investigation on account of its revelation of weakness present in the bureaucratic administration then in vogue in the service. He has been an instructor at the Art Students' League of New York and was the creator of many marine murals upon the better known private American yachts. He contributed many articles on naval topics, mostly illustrated by himself, to magazines, notably to "Collier's Weekly," etc.

REUTLINGEN, a town of Württemberg; 8 miles E. by S. of Tübingen and 20 S. of Stuttgart. Many of its houses are old and picturesque. The Church of St. Mary (1247–1343), with a tower 243 feet high, is a noble Gothic edifice. Prior to the World War woolen and cotton yarns were spun, and cloth, leather, cutlery, hosiery, paper, etc., were manufactured. Reutlingen was formerly a free imperial town and a member of the Suabian League; it came to Württemberg in 1802. Pop. about 30,000.

REVAL, or **REVEL**, a Russian seaport; capital of the Republic of Esthonia (*q. v.*); on a small bay on the S. side of the Gulf of Finland, opposite Helsingfors (52 miles distant), and 232 miles W. S. W. of St. Petersburg. It is divided into the (old) upper and (new) lower towns. The former contains the cathedral, the castle, governor's residence, and the houses of the (German) nobility. The new town extends outside the city wall. There are several mediæval guild houses, in some of which are preserved valuable archives, and an important museum of antiquities. Prior to the World War, Reval exported cereals (chiefly oats), spirits, flax, and other commodities. There was little industry, brandy, vinegar, and wool being manufactured to a small extent. Pop. (1910) 98,995. More than one-half were Esthonians, and nearly one-fourth of German descent. Reval was founded by Waldemar II. of Denmark in 1219, and became a flourishing Hanse town. It was long held (from 1346) by the Livonian Knights, was made over to Sweden in 1561, and was besieged by Peter the Great and annexed to the Russian empire in 1710. In 1713 a naval harbor was founded. In the course of the World War Reval was bombarded by the Germans on different occasions.

REVEILLÉ, the signal given in garrisons at break of day, by beat of drum or sound of bugle, for the soldiers to rise and the sentinels to forbear chal-

lenging until the retreat is sounded in the evening.

REVELATION, the act of revealing, disclosing, or making known that which is secret, private, or unknown; disclosure. Specifically, the act of revealing or communicating divine truth. Also that which is revealed, disclosed, or made known; specifically, the Bible.

REVELATION OF ST. JOHN, the last book of the New Testament, and the only distinctively prophetic one given to fling back the veil which hides futurity from the view. Its writer was John (i. 4, xxii: 8), the servant of God (i: 1), the "brother" and "companion in tribulation" of the then persecuted Christians, himself an exile in Patmos, "for the word of God and for the testimony of Jesus Christ" (i: 9). It was there he saw the prophetic visions, narrating them after he left the island. The majority of the Fathers and the Church of the Middle Ages considered, as do most modern Christians, that the author was John the Apostle; though Dionysius of Alexandria, and some others among the ancients, believed him to have been a certain John the Presbyter (mentioned by Papias, Dionysius, Eusebius, and Jerome), whose tomb, like that of the apostle, was said to be at Ephesus. Among those who accept the apostolic authorship of the work, two views are current as to its date. The prevailing one is, that the visions in Patmos were seen in A. D. 96, and the work penned in that year or in 97, the reigning emperor being Domitian. The other view is, that it was penned about A. D. 68 or 69. Ch. xvii: 10 is interpreted to mean that five Roman emperors had reigned and died, viz., Augustus, Tiberius, Caligula, Claudius, Nero, "one is," *i. e.*, Galba or if Julius Cæsar be considered the 1st emperor, then the "one" is Nero. Respecting the canonicity of this book, it was alluded to or quoted in Hermas, Papias, Melito, Justin Martyr, the fragment published by Muratori, Theophilus, of Antioch, Apollonius of Ephesus, Irenæus, Hippolytus, Tertullian, Clement of Alexandria, Origen, Jerome, etc. It was not in the Old Syrian version, though some Greeks accepted it. The Corinthians, Caius of Rome, and others rejected it. Luther, Carlstadt, and Zwingli spoke of it disparagingly, but it is accepted by the Churches of the Reformation as well as by the Roman Church. Three schemes of interpretation exist: The Preterist, which makes the events predicted now wholly passed; the Futurist, which regards them as future, and that of a third and numerous school, who regard the visions as an historical or continuous prediction of the whole history of the Church from apostolic times to the consummation of all things.

REVELS, MASTER OF THE, an English officer in former times appointed to superintend the revels or amusements, consisting of dancing, masking, etc., in the courts of princes, the inns of court, and noblemen's houses, during the 12 Christmas holidays. He was a court official from the time of Henry VIII. to that of George III.

REVENUE, the income of a nation derived from taxes, duties, and other sources, for public uses. See articles on the different countries.

REVENUE CUTTER, a small armed steam vessel, designed for the prevention of smuggling; so called from the fact that originally the vessel was of the cutter-yacht type.

REVENUE CUTTER SERVICE, UNITED STATES, a military service organized in 1790 by Congress to enforce the navigation and customs laws. The United States navy had not at that date been established and the service was made a branch of the Treasury as it is today. The service, consisting at first of ten small vessels, was gradually added to and became the nucleus of a navy. Congress in 1799 authorized the President to employ it to defend the seacoast and repel hostility to vessels and commerce within their jurisdiction. The development was necessary, for American foreign commerce meant in those days a corresponding growth in shipping with a corresponding liability to collision with foreign interest. From 1843 onward vessels driven by steam gradually replaced the old sailing vessels.

The necessity for the service was shown almost from the year of its organization. The War of the Revolution had been fought almost wholly on land and its success had turned American eyes away from the requirements of a naval arm. Very speedily, however, the cutters justified their existence. They had repeated clashes with the British and French forces and upheld the dignity of the United States. In 1812 it made foreign invasion impossible and helped in transporting troops in the Nullification troubles of 1832-33 and the Seminole War of 1836. In the Civil War the cutters pursued blockade runners, carried dispatches, and joined in attacks on Southern forts. During the Spanish War the service showed itself a most efficient arm of the navy, contributing 20 vessels and nearly a hundred guns to the forces. During the

World War the service beginning with 44 vessels had them added to and acted as a complement to the navy in so far as its coastwise duties enabled it so to do. The captain commandant of the service is under the direction of the Secretary of the Treasury, and under him are the five divisions of the service, each with a senior captain. The vessels have done duty on the Alaskan coast and occasionally make prolonged voyages, and have often done good work in cases of disasters at sea. In 1915 the Life Saving and Revenue Cutter services were merged into the Coast Guard.

REVERBERATORY FURNACE, a furnace in which ore, metal, or other material is exposed to the action of flame, but not to the contact of burning fuel.

REVERE, a city of Massachusetts, in Suffolk co., on the Boston and Maine railroad. It forms a suburb of Boston, which it joins on the northeast. An excellent beach makes it a favorite bathing resort, and the State has constructed a magnificent public bath house. Among its notable buildings are a city hall and a public library. Pop. (1910) 18,219; (1920) 28,823.

REVERE, PAUL, an American patriot, famous for his midnight ride from Boston to Lexington; born in Boston, Mass., Jan. 1, 1735. He was the son of a goldsmith from Guernsey, whose trade he followed after serving as a lieutenant of artillery in the expedition against Crown Point (1756). He also engaged in copperplate printing, and before the Revolution constructed a gunpowder mill. A keen patriot, he was one of the party that destroyed the tea in Boston harbor, and he was at the head of a volunteer committee, consisting of 30 young mechanics, who formed a secret society to watch the British. When it was known that the latter intended to move, Revere crossed over to Charlestown, and April 18, 1775, the night before Lexington and Concord, at a signal rode on to Lexington and to Lincoln, rousing the minutemen as he went; at Lincoln he was stopped, but a companion succeeded in reaching Concord. His ride is the subject of a well-known poem by Longfellow. During the war he rose to lieutenant-colonel of artillery; afterward he returned to his goldsmith's work, and in 1801 founded the Revere Copper Company at Canton, Mass. He died in Boston, May 10, 1818.

REVERSION, a right or hope to future possession or enjoyment; right of succession; succession. Also a reversionary or deferred annuity, *i. e.*, an annuity which does not begin to be paid at once, but at a certain future day. In biology, the tendency of an animal or a plant to revert to long-lost characters. Darwin contends that it is by no means so potent as is generally believed. It is easy to breed cart or race-horses, long and short-horned cattle, and esculent vegetables without their reverting to the characters of the aboriginal stock. He also believes that reversionary and analogous characters can be easily confounded.

In law, the returning of an estate to the grantor or his heirs after a particular estate is ended. An estate in reversion is the residue of an estate left in the grantor, to commence in possession after the determination of some particular estate granted out by him. The term is sometimes improperly extended to any future estate in reversion or remainder. Reversion of series, in mathematics, when one quantity is expressed in terms of another, by means of a series, the operation of finding the value of the second in terms of the first, by means of a series, is called the reversion of the series.

REVETMENT, in fortification, a facing to a wall or bank, as of a scarp or parapet. The material depends upon the character of the work. In permanent works it is usually of masonry; in field works it may be of sods, gabions, timber, hurdles, rails, or stones. In civil engineering, a retaining or breast wall at the foot or on the face of a slope.

REVISED VERSION, a revised edition of the Authorized Version of the Bible. The resolution to undertake it was come to by the Convocation of Canterbury in February and May, 1870, and various members were nominated to carry out the work. Co-operation was sought from scholars in the other churches and from an American committee. A better text was constructed, manuscripts being used which had been discovered since the Authorized Version had been made. Revision, not retranslation, was aimed at, as few alterations as possible being introduced, and these only if adopted by the votes of two-thirds of the translators. Poetry was printed in lines, showing the rhythm. The New Testament was published in May, 1881, the Old in May, 1885.

REVIVAL, the act of reviving; the state of being revived; most commonly used in a religious sense. Revivals occur in all religions. When one takes place a large number of persons who have been comparatively dead or indifferent to spiritual considerations, simul-

taneously or in quick succession become alive to their importance, alter spiritually and morally, and act with exceeding zeal in converting others to their views. A Mohammedan revival takes the form of a return to the strict doctrines of the Koran, and a desire to propagate them by the sword. A Christian minority living in the place is in danger of being massacred by the revivalists.

Christian Revivals.—Pentecostal effusion of the Holy Spirit (Acts ii) produced a revival within the infant Church, followed by numerous conversions from outside. Revivals, though not called by that name, occurred at intervals from apostolic times till the Reformation, the revivalists being sometimes so unsympathetically treated that they left the Church and formed sects, while in other cases, and notably in those of the founders of the monastic orders, they were retained and acted on the Church as a whole. The spiritual impulse which led to the Reformation, and the antagonistic one which produced or attended the rise of the Society of Jesus, were both revivalist. It is, however, to sudden increase of spiritual activity within the Protestant churches of the English-speaking peoples that the term revival is chiefly confined. The enterprise of the Wesleys and of Whitefield in this country and England from 1738 onward was thoroughly revivalist. There were revivals at Northampton, in Massachusetts, in 1734, and throughout New England in 1740–1741, the Rev. Jonathan Edwards being the chief instrument in their production. A great one arose in America in 1857, after the financial crisis of that year. It spread in 1859 to Ireland, and in 1864 to Scotland and to parts of England. Since then various revivals have from time to time occurred, and nearly all denominations aim at their production. One of the most remarkable movements of modern times, properly coming under the head of a revival, is that of the SALVATION ARMY (*q. v.*), founded by the Rev. William Booth, a Methodist minister of Nottingham, England. This movement has been recognized since 1880 as a distinct sect, and with its essential military organization has become an immense power among the poorer classes both in this country and in Europe. In the United States the commander, Ballington Booth, withdrew from the Salvation Army and organized the Volunteers of America. Modern revivalists include J. Wilbur Chapman, "Gypsy" Smith and William A. Sunday. See also MOODY.

REVIVAL OF LETTERS, the revival of literature after the apparent death-blow which it received when the barbarous nations of the North destroyed the civilized Roman empire. It commenced in England feebly at the beginning of the 11th century, and became more potent in the 14th, 15th and subsequent centuries.

REVOCATION, in law, the destroying or annulling of a deed or will which had existence till the act of revocation made it void. The revocation of a deed can only be effected when an express stipulation has been made in the deed itself reserving this power. The revocation of a will can be made in four different ways: (1) by another will; (2) by intentional burning, or the like; (3) by the disposition of the property by the testator in his lifetime; (4) by marriage.

REVOCATION OF THE EDICT OF NANTES. See EDICT OF NANTES.

REVOLUTION, a fundamental change in government, or in the political constitution of a country, effected suddenly and violently, and mainly brought about by internal causes; a revolt against the constituted authority successfully and completely accomplished. In most revolutions there are three turns of the wheel. First there is a moderate movement forward, then, after a time, a second forward movement. The extreme party who now come into power create a reaction against the revolution, and the wheel moves backward. In the great French Revolution first there were the Girondists, then the Jacobins, then the reaction to monarchy under the first Napoleon, and in due time again to the Bourbons. In the United States the term Revolution is applied specifically to the American War for Independence, which began in 1775 with the irregular running fight popularly known as the battle of Lexington, and practically ended with the surrender of Lord Cornwallis, at Yorktown, Va., to the combined forces of the French and Americans, in the year 1781. The English Revolution was that revolution in England by which James II. was driven from the throne in 1688. The Russian Revolution was that of 1917 which led to the triumph of the Bolsheviki over the moderates, and the development of Soviet power. The German Revolution was that of 1918, by which the German Emperor and the kings and other reigning princes of the various sovereign German states were driven from their thrones.

In astronomy: (1) The motion of a planet around the sun, or of a satellite around a planet. The point to which it

returns is called annual, anomalistic, nodical, sidereal, or tropical, according as it has a relation to the year, the anomaly, the nodes, the stars, or the tropics. (2) See ROTATION. In geometry, when one line moves about a straight line, called the axis, in such a manner that every point of the moving line generates a circumference of a circle, whose plane is perpendicular to the axis, that motion is called revolution, and the surface is called the surface of revolution. Every plane through the axis is called a meridian plane, and the section which this plane cuts from the surface is called a meridian curve. Every surface of revolution can be generated by revolving one of its meridian curves about the axis. The revolution of an ellipse round its axis generates an ellipsoid; the revolution of a semicircle round the diameter generates a sphere; such solids are called solids of revolution.

REVOLUTIONARY CALENDAR, a calendar designed to be philosophic, decreed on Nov. 24, 1793, to commence from the foundation of the French republic, Sept. 22, 1792. The 12 months were Vendémiaire, Brumaire, Frimaire, Nivose, Pluviose, Ventose, Germinal, Floréal, Prairial, Messidor, Fervidor or Thermidor, and Fructidor. The first three constituted Autumn, the second three Winter, the third Spring, and the fourth three Summer.

REVOLUTIONARY TRIBUNAL, in French history, the name given on Oct. 30, 1793, to what had before been called the Extraordinary Tribunal. It sent many victims to the guillotine.

REVOLVER, a description of firearm in which a number of charges contained in a revolving cylinder are, by pulling the trigger, brought successively into position and fired through a single barrel. For the introduction of the revolver in its present form we are indebted to Col. Samuel Colt, of Hartford, Conn., though repeating pistols had long been known in other countries. In the Smith and Wesson revolver (adopted by Austria and Russia), facility in loading is a feature, the cylinder and barrel together being pivoted to the front of the stock, so that by setting the hammer at half-cock, raising a spring-catch, and lowering the muzzle, the bottom of the cylinder is turned up to receive fresh metallic cartridges. When this is done the muzzle is pressed back till the snap-catch fastens it to the back plate, and the revolver is again ready to be fired. In the latest form of this revolver the spent cartridges are thrown out of the cylinder by means of an automatic discharger. The British regulation army revolver is Webley and Scott's, Mark IV. .445. The weapon can also be easily and instantly unloaded, and some are made with covered hammers, safety bolts, etc. The revolver principle has also been applied to rifles, and to guns for throwing small projectiles, as in the Gatling and other machine guns.

REWA, a state of India, called also BAGHELKHAND. Area, 13,000 square miles. Pop. about 1,500,000. REWA KANTHA is the name of a political agency under the government of Bombay, containing 61 small states, of which five are tributary to the British Government, and most of the remainder to Baroda. The territory included, covering an area of about 5,000 square miles, with a population of about 700,000, lies mainly along the S. bank of the lower Nerbudda with patches N. of it, and on the W. borders on Broach, Baroda, and Ahmadabad.

REWARD, in a legal sense, some encouragement which the law holds out for exertions in bringing certain classes of criminals to justice. The courts of assize may order the sheriff of the county, in which certain offenses have been committed, to pay to persons who have been active in securing the apprehension of offenders charged with crimes, or with being accessory before the fact to any of such offenses, or to receiving any stolen property, a reasonable sum to compensate them for expense, exertion, and loss of time. So by a later statute courts of quarter sessions are authorized, in the case of any of the above offenses which they have jurisdiction to try, to order such compensation; but the payment to one person must not exceed $25. If any one is killed in endeavoring to apprehend a person charged with one of these offenses, the court may order compensation to be made to the family. The amount to be paid in all such cases is subject to regulations which may be made from time to time by the Secretary of State. By another statute it is a felony, punishable by penal servitude to the extent of seven years, to corruptly take any reward for helping a person to property stolen or embezzled, unless all due diligence to bring the offenders to trial has been used. In Great Britain an advertisement offering a reward for the return of stolen or lost property, using words purporting that no questions will be asked or inquiry made after the person producing the property, renders the advertiser, printer, and publisher liable to forfeit $250. The offering of rewards by the government has in England been discontinued on grounds of public policy. In the World

War, however, the British Government offered rewards for the apprehension of dangerous enemy spies and others.

REWARI, a town of the district of Gurgaon, in the extreme S. of the Punjab, 50 miles S. W. of Delhi, an important center for trade between the Punjab and Rajputana. Pop. about 25,000.

REXFORD, EBEN EUGENE, an American poet; born in Johnsburg, N. Y., July 16, 1848. He began to write when a mere child, contributing to periodicals and magazines. He published in book form the poems "Brother and Lover" and "Grandmother's Garden" (1887); and a story, "John Fielding and His Enemy" (1888). "The Swamp Secret" (1897); "Into the Light" (1899), etc. He wrote the popular songs "Silver Threads Among the Gold" and "Only a Pansy-Blossom." He died in 1916.

REYES, BERNARDO, a Mexican soldier, born in the Province of Nuevo León. He studied in France. Returning to Mexico, he joined the army, where he rapidly rose in rank, became one of the principal generals in the later Díaz régime, was appointed Governor of the State of Nuevo León, and served also as Minister of War and Marine. He incurred the suspicion of Díaz and in 1909, after having headed a revolt, he was banished. He joined the Madero movement in 1911 and was a candidate for the presidency, but withdrew before the election. He was arrested in San Antonio, Tex., for violation of the neutrality laws, but was released. When he returned to Mexico, he endeavored to start a revolt, but failed and surrendered himself to Madero in December, 1911. He was kept in prison for two years and was released during the uprising against Madero in 1913. In the fighting which followed this, he was killed.

REYES, RAFAEL, a Colombian soldier and politician, born at Santa Rose de Viterbo, in 1852. During his earlier life he conducted important explorations in South America. Becoming engaged in politics, he took a large part in the internal struggles of Colombia. He commanded the government forces during the uprising of 1885, was Minister of the Interior under President Nuñez, and served also as Minister to France and Switzerland. He represented Colombia in several foreign negotiations, including those for the Panama Canal. In 1904 he was elected President of Colombia. His administration was on the whole excellent, but objection was made to his imperious policies, and he resigned in 1910. He wrote several books, including "The Two Americas" (1914).

REYNARD THE FOX, the title of a well-known popular epic, the characters of which are animals instead of men. It belongs to the series of beast fables which have delighted the popular imagination from early ages and in all lands, from India to the Bushmen's country in South Africa.

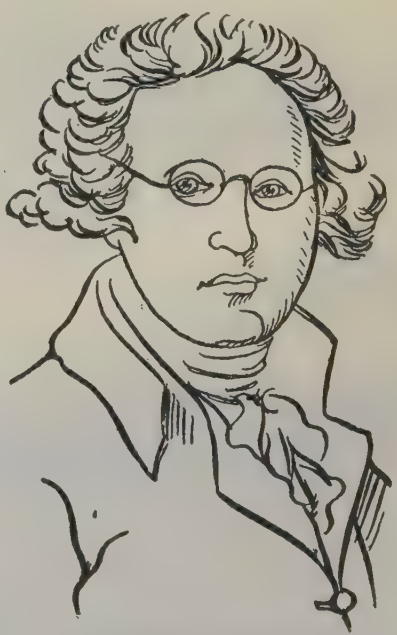
REYNOLDS, JAMES BURTON, an American public official, born in Saratoga, N. Y., in 1870. He was educated at Dartmouth College, and after some years of journalistic work with Boston and New York newspapers, he became secretary of the Republican State Committee of Massachusetts in 1896, serving until 1905. From 1905 to 1909 he was an assistant secretary of the treasury, spending some time during 1907 and 1908 in various European countries as chairman of the government commission to consider trade relations between these countries and the United States. From 1909 to 1912 he was a member of the United States Tariff Board. In July, 1912, he became secretary of the Republican National Committee, resigning in January, 1920, to take charge of the campaign for the presidential nomination of Governor Coolidge of Massachusetts.

REYNOLDS, JOHN FULTON, an American military officer; born in Lancaster, Pa., Sept. 20, 1820; was graduated at the United States Military Academy in 1841; as 1st lieutenant served in the Mexican War in 1846-1847; was promoted captain in 1855; and was appointed commandant at West Point in 1859. At the beginning of the Civil War he was appointed a lieutenant-colonel of volunteers; led a brigade in the Seven Days' battles, in June, 1862, near Richmond, when he so distinguished himself for skill and bravery that he was given the brevets of colonel and brigadier-general, U. S. A. In 1863 he succeeded Hooker in command of the 1st Army Corps; in 1863 was promoted Major-General of volunteers. His corps was the vanguard at Gettysburg, where he was killed, July 1, 1863.

REYNOLDS, JOSEPH JONES, an American military officer; born in Flemingsburg, Ky., Jan. 4, 1822; was appointed to the United States Military Academy from Indiana in 1839; on graduation was appointed 2d lieutenant, 4th Artillery, and after service at Fort Monroe and in Texas was, in 1846, assigned to the 3d Artillery and was on frontier duty at Fort Washita, I. T., in 1855-1856; then became Professor of Mechanics and Engineering at Washington

University, St. Louis, and was also stationed at other colleges. After the beginning of the Civil War he rapidly rose in rank from colonel of the 10th Indiana Volunteers to Major-General of volunteers; during that time he was in command of Camp Morton, Indianapolis, and Cheat Mountain district, W. Va. In Tennessee he was engaged in the actions at Hoover's Gap, battle of Chickamauga, and battle of Chattanooga; later was in command of the defenses of New Orleans from Jan. 6 to June 16, 1864; was in command of the 19th Army Corps, and assisted in organizing the forces for the capture of Mobile and Forts Gaines and Morgan, Mobile harbor, in the same year. He was in command of the Mississippi river from its mouth to Memphis, Tenn., from October to December, 1864; was mustered out of the volunteer service in 1866, and was promoted colonel in the regular army in the same year; was brevetted Brigadier-General in 1867 for gallant and meritorious service at the battle of Chickamauga, and was in the same year brevetted Major-General for similar service at the battle of Missionary Ridge; after service in the 25th Infantry he was transferred to the 23d Cavalry in 1870, and after that time served at Fort McPherson and other military stations and on various boards till retired from active service June 25, 1877, for disability contracted in the line of duty. He died in Washington, D. C., Feb. 25, 1899.

REYNOLDS, SIR JOSHUA, an English portrait and subject painter; born in Plympton Earls, near Plymouth, July 16, 1723. His father, a clergyman and master of Plympton grammar school, intended him for the medical profession; but he developed a strong aptitude for painting, was continually studying the plates in Cat's "Book of Emblems," Dryden's "Plutarch," and the other volumes that came in his way, and at the age of eight had mastered the "Jesuit's Perspective," and applied its principles to drawings executed by himself. In October, 1740, accordingly, he was sent to London to study art, and placed in the studio of Thomas Hudson, a portrait painter. In 1743 he returned to Devonshire, and some of the portraits of local worthies which he then produced still exist. In the following year he was again in London pursuing his art; but in the beginning of 1747, after the death of his father, he settled in Plymouth Dock, now Devonport, where he learned much from a study of the works of William Gandy of Exeter. In 1749 he made the acquaintance of Commodore, afterward Lord, Keppel, who invited him to accompany him on a cruise in the Mediterranean; and, after painting many of the British officers in Minorca, he made his way to Rome, where he studied Raphael and Michelangelo and in the Vatican caught a chill which permanently affected his hearing. He also visited Bologna, Genoa, Florence, Parma, and Venice. Returning to England in October, 1752, he soon afterward established himself in a studio in St. Martin's Lane, London, and attracted notice by his portraits of the second Duke of Devonshire and Commodore Kep-



SIR JOSHUA REYNOLDS

pel. Before long he was in excellent practice, and in the year 1755 he had no fewer than 120 sitters. In 1760, he purchased a mansion on the W. side of Leicester Square, to which he added a studio and reception room.

In 1764 he founded the famous literary club of which Dr. Johnson, Garrick, Burke, Goldsmith, Boswell, and Sheridan were members; all of whom were portrayed by his brush. He was one of the earliest members of the Incorporated Society of Artists, and contributed to its exhibitions till 1768, when, on the establishment of the Royal Academy, he was elected its first president; and in the following year received the honor of knighthood from the king. In 1769 he delivered the first of his "Discourses" to the students of the Academy, 15 of which have been published. They are

full of valuable and well-considered instruction, and, along with his papers on art in the "Idler," his annotations to Du Fresnoy's "Art of Painting," and his "Notes on the Art of the Low Countries," show a correct and cultivated literary style. He contributed his picture of Miss Morris as "Hope nursing Love" to the first exhibition of the Royal Academy, along with his portraits of the Duchess of Manchester, Mrs. Blake, Mrs. Crewe, and Mrs. Bouverie; and in 1771 completed his subject of "Count Ugolino and his Children in the Dungeon," usually regarded as his most successful effort in the direction of historical art. In 1784 he succeeded Allan Ramsay as painter to the king; in the same year he finished and exhibited his portrait of Mrs. Siddons as the "Tragic Muse," undoubtedly his greatest portrait, and in 1787 he undertook three subjects for Boydell's Shakespeare Gallery, executing "Puck," "The Witch Scene from Macbeth," and "The Death of Cardinal Beaufort."

He suffered a slight attack of paralysis in 1782, and in 1789 his sight became affected. The following year was embittered by an unfortunate dispute with the Academy which led to his resignation of the presidentship, a resolution which he afterward considered and rescinded; and on Dec. 10, 1790, he delivered his last "Discourse" to the students. He died Feb. 23, 1792.

It is in virtue of his portraits that Reynolds ranks as the head of the English school of art. In the dignity of their style, the power and expressiveness of their handling, the variety and appropriateness of their attitudes, in the beauty of their coloring and the delicacy of their flesh-painting, his portraits have never been surpassed. His efforts in the higher departments of historical and imaginative art were less successful. In his technical methods Reynolds was unfortunately most careless and uncertain. He was continually experimenting in new processes and untried combinations of pigments, with the result that even in his own lifetime his works deteriorated, especially in their flesh-tints.

Personally Reynolds was a man of fine and varied culture, and he was distinguished by an exquisite urbanity, the expression of a most amiable and equable disposition, which was exceptionally fitted to win and retain friendship.

The first great collection of the works of Reynolds was brought together by the British Institution in 1813, and numbered 142 pictures. His authentic works have been estimated by Taylor to number between 2,000 and 3,000; and from these some 700 engravings have been executed, some of them—such as the mezzotints of J. R. Smith, John Dixon, William Dickinson, and James M'Ardell—ranking among the finest examples of the art.

REYNOLDS, ROBERT M., lawyer and diplomat, was born in Muskingum co., Ohio, Aug. 30, 1826. He received a classical education, removed to Illinois in 1847, and to Iowa in 1851. There he was principal of an academy and a teacher of mathematics for ten years and also studied law. Married in 1850 Orpha W. Richardson, of La Harpe, Illinois. Had six children, four sons, two daughters. He enlisted in the 1st Iowa Cavalry in 1861 and became a veteran by re-enlistment in 1864. He was three times wounded in action and was mustered out of service as a brigadier general by brevet in 1865. In that year he settled in Alabama. He was a member of the state constitutional convention of 1867 and was admitted to the bar at Montgomery, Ala. In 1868 he was elected auditor of the state, and served for more than four years. He was minister resident of the United States to Bolivia during 1874-77, and in 1878 was appointed first auditor of the U. S. treasury at Washington. Served as First Auditor in the Treasury until March, 1885. Died in St. Louis, June 2, 1885.

RHÆTIA, a province of the Roman empire, which included great part of the Alpine regions between the valleys of the Danube and the Po, and corresponded with the districts occupied in modern times by the Austrian province of Tyrol and the Swiss canton of Grisons. The Rhætians, who are generally supposed to have been of Etruscan origin, were subdued by Drusus and Tiberius, 15 B. C.; and shortly afterward Rhætia was incorporated as a province in the Roman empire. During the last days of the Roman empire, when the barbarians devastated the provinces, Rhætia was nearly depopulated; and after the fall of the Roman empire it was occupied by the Alemanni and Suevi.

RHAMNACEÆ, an order of plants, classed by Lindley under his 44th or Rhamnal alliance. The calyx, which is four or five cleft, is valvate. The petals are as many and inserted into the orifice of the calyx; sometimes they are wanting. The stamens are four or five, and opposite to the petals; fruit berried or dry. The flowers are small and generally green. The order consists of trees and shrubs, often spiny. There are species in nearly all countries, with the exception of the Arctic zone. Known

genera 42, species 250 (Lindley); genera 37, species 430 (Sir Joseph Hooker). Berries belonging to various plants of the order have been used for dyeing yellow, green, or intermediate tints, others are eatable. One plant is used by the poorer classes in China for tea. Others have been employed as astringents, purgatives, tonics, sedatives, etc.

RHAPSODIST, strictly, one who strings songs together, but usually applied to a class of persons in ancient Greece, who earned their living by reciting the poems of Homer. It is believed that to these persons we are chiefly indebted for the preservation of the Homeric poems. In the present day, a rhapsodist is one who composes rhapsodies or collections of poetical effusions, descriptions, etc., strung together without any natural connection or necessary dependence.

RHATANY, or RATTANY, a half shrubby plant, of the natural order *Polygaleæ*, a native of the cold sterile tablelands of the Andes in Peru and Bolivia. It is called ratanhia in Peru. It is valued for the medicinal properties of the root, which are shared more or less by other species of the same genus, also natives of South America. In the British Pharmacopæia the dried roots of two species (*Krameria triandra*, Peruvian rhatany, and *K. ixina*, Savanilla rhatany) are officinal under the name *Krameriæ Radix*. The roots vary a good deal in size and thickness, but are always rough-looking, and reddish in color. The bark has a strongly astringent taste, and when chewed tinges the saliva red; the wood is nearly tasteless. The dried root is a powerful astringent, and is employed in diarrhæa, mucous discharges, passive hæmorrhages, and cases where an astringent or styptic action is indicated. The finely-powdered root is also a frequent constituent of tooth-powders. Rhatany root is imported from various parts of South America, but chiefly from Lima. It is extensively imported into Portugal in order to communicate a rich red color to wines. Its peculiar properties are due to rhatany-tannic acid, found in the root-bark to the extent of 20 per cent.; it also contains a red coloring matter.

RHEA, in ornithology, a genus of *Struthionidæ*, or, if that family is divided, of *Struthioninæ*. Three toes are present, the neck is covered with feathers, and the tail is almost obsolete. They are sometimes called South American ostriches, but are smaller than the true ostrich, and the whole plumage is somber. There are two well-established species, *R. americana*, the common, and *R. darwini*, Darwin's rhea, the former ranging from Bolivia, Paraguay, and the S. of Brazil down to Magellan's Straits, the latter inhabiting eastern Patagonia. *R. macrorhyncha* was given specific distinction by Dr. Sclater in 1860, but subsequent investigations led him to believe that the individuals belonged to a locally isolated race of *R. americana*, probably existing somewhere in the campos of the interior of northeastern Brazil.

RHEA, a variety of the nettle family, which grows luxuriantly in India. From the delicate fibers in its bark the finest and strongest textile fabrics can be produced, and in the manufacture of such fabrics it is unrivalled. The hindrance to its use has hitherto lain in the difficulty and cost of separating the fibers

RHEA

from the gums and cortex of the bark in which they are embedded. However, an Anglo-Indian chemist, Mr. Gomess, has succeeded in elaborating a chemical process which frees the fiber from the resins in which it is imbedded, by the use of zincate of soda; and this process, after numerous trials, the Indian Government pronounced a complete success. A large demand consequently developed for the "ribbons" or strips of dried bark. Rhea fibers can be worked into every variety of fabric, from velvets to laces. It is specially suitable, from its lightness and toughness, for tents and ship canvas, and it is found to be far more durable than linen.

RHEA, MADEMOISELLE (Mlle. Hortense Barbe-Loret), a Belgian actress; born in Brussels, Belgium, Sept. 4, 1844. Educated at the Ursuline Con-

vent, Paris, France; she began to study for the stage soon after leaving school; made her début at the Théâtre de la Monnaie, Brussels, in "Fairy Fingers"; was engaged at Rouen and at the Vaudeville, Paris; made a tour of France; was leading actress at the Imperial Theater, St. Petersburg, 1876-1881; played, in English, Beatrice in "Much Ado About Nothing," at the Gaiety Theater, London, in 1881; acted in the United States in 1881 and 1882. Her repertory contained "Adrienne Lecouvreur"; "Camille"; "Pygmalion and Galatea"; "School for Scandal"; "Frou-Frou"; "The New Magdalen"; "Lady of Lyons"; "Nell Gwynn"; etc. She died in Montmorency, France, May 5, 1899.

RHEAD, LOUIS JOHN, an Anglo-American artist, born in Etruria, England, in 1857. Having studied art at the Art Training School, South Kensington, London, he came to the United States in 1883, as art manager for a large publishing house. He painted in oil and water colors. Besides exhibiting in many American and European galleries, he also illustrated numerous books, especially the Louis Rhead series of juvenile classics. He also contributed to newspapers and magazines frequent articles on fly fishing. Gold medals were awarded to him at Boston, in 1895 and at St. Louis, in 1904. He published "Bait Angling" (1907); "Book of Fish and Fishing" (1908); and "American Trout Stream Insects" (1916).

RHEES, BENJAMIN RUSH, an American educator; born in Chicago, Ill., Feb. 8, 1860; was graduated at Amherst College in 1883, and at the Hartford Theological Seminary. In 1889 he accepted a pastorate at Portsmouth, N. H., where he remained till 1892 when he went to the Newton Theological Institution, Newton Center, Mass., and in 1894 became Professor of Biblical Interpretation of the New Testament. There he became a member of the Society of Biblical Literature and Exegesis; and was author of "The Life of Jesus of Nazareth, a Study"; "History of Theology"; etc. He was elected president of the University of Rochester, Rochester, N. Y., and Burbank professor of Biblical Literature, July 1, 1900.

RHEIMS, or REIMS, a city in the French department of Marne; on the Vesle; 98 miles E. N. E. of Paris. Strongly fortified with detached forts since the Franco-Prussian War, when it was for a time the German headquarters; it is well built, and from the material employed in building, which is the chalkstone of the district, and from the prevalence of the older style of domestic architecture, has a picturesque appearance. It is built on the site of Durocortorum, which is mentioned by Cæsar as the capital of the Remi, from which people it subsequently took its present name. Christianity may have found an entrance into Rheims at an earlier period, but it was not till about 360 that it became a bishop's see. Under the Frank rule it was a place of much importance, and it acquired a deeply religious interest from its having been the scene in 496 of the baptism of Clovis and his chief officers by the bishop, St. Remy (438-533). In the 8th century it became an archbishopric, and from 1179, when Philip Augustus was solemnly crowned here, it became the place for the coronation of the kings of France, who were anointed from a vessel of sacred oil, called "sainte ampoule," which a dove was said to have carried to St. Remy from heaven. Joan of Arc brought the dauphin hither, and the only sovereigns in the long series, down to 1825, not crowned at Rheims were Henry IV., Napoleon I., and Louis XVIII. In 1793 the cathedral was attacked by the populace, and the sainte ampoule smashed by a sansculotte; and in 1830 the ceremony of coronation at Rheims was abolished. The cathedral, though the towers of the original design are still unfinished, is one of the finest extant specimens of Gothic architecture. It was built between 1212 and 1430, and in 1877 the government voted $400,000 toward restoration. Its nave is 466 feet long by 99 in breadth, with a transept of 160 feet, and the height is 144 feet. Its grandest features are the W. façade, which is almost unrivaled, with its magnificent doorway, and the so-called Angel Tower, which rises 59 feet above the lofty roof. The stained glass is remarkable for its beauty; the organ is one of the finest in France; and two survive out of six magnificent tapestries. The Romanesque church of St. Remy (mainly 1160-1180), with the saint's shrine, is nearly of equal size, but of less architectural pretension. Also noteworthy are the town hall (1627-1880); the ancient "Maison des Musiciens" (Musicians' House), and archiepiscopal palace; the Porta Martis, a Roman triumphal arch; the Lycée, representing a former university (1547-1793); and statues of Louis XV. and two natives, Colbert and Marshal Drouet. Rheims, prior to the World War, was one of the principal entrepôts for the wines of Champagne, and the hills which surround the town were planted with vineyards, and many workmen were employed. It

was one of the great centers of the woolen manufacture in France, and its manufactures, embracing woolen goods (especially merinoes), mixed fabrics in silk and wool, etc., known in commerce as "Articles de Rheims." During the World War the Germans repeatedly bombarded the town and practically destroyed it. The famous cathedral was the special mark of their long-range guns and was badly shattered. Rheims was never entered by the Germans. Pop. (in normal times) about 118,000.

RHENISH PRUSSIA (German, Rheinland), the extreme W. province of Prussia, touching W. and N. Luxemburg, Belgium, and Holland; area, 10,423 square miles; greatest length from N. to S. about 200 miles; greatest breadth about 90; pop. about 7,120,000. In the S. it is hilly, being traversed by the ranges of the Eiffel, Hochwald, etc. It is watered by the Rhine, the Moselle, and some affluents of the Meuse. A large proportion of the surface is in forest. Besides the usual cereal crops, tobacco, hops, flax, rape, hemp, and beet-root are raised; fruit culture and the vine culture are also carefully attended to. Cattle are extensively reared. It is the most important mineral district in Germany, abounding in coal, iron, lead, zinc, etc. It is likewise an active manufacturing district, there being numerous iron works and machine shops, textile factories, breweries, distilleries, etc. It is divided into five governments or districts of Coblentz, Treves, Cologne, Aachen (Aix-la-Chapelle), and Düsseldorf. The city of Coblentz is the official capital of the province, but Cologne is the town of most importance. A portion of Rhenish Prussia was included in the occupied area following the armistice of Nov. 11, 1918. Coblentz was the chief depot for the American Army of Occupation, while Cologne was the headquarters for the British forces. See RUHR DISTRICT; SARRE BASIN.

RHESUS, a king of Thrace, whose horses were carried off and himself killed by Ulysses and Diomede, in the night on which he came to assist Priam, before they could drink of the water of the Xanthus, as the oracle had declared that otherwise Troy could not be taken.

RHESUS, a genus of monkeys, separated by Lesson from Macacus. Also *Macacus rhesus*, the Rhesus monkey, from India, in some parts of which it is considered sacred. Length, from 18 inches to 2 feet; tail from 6 to 8 inches. Prevailing color olive-green, brown on back, face pale flesh-color, callosities and insides of legs often very red.

RHETORIC, in its broadest sense, the theory and practice of eloquence, whether spoken or written. It aims at expounding the rules which should govern all prose composition or speech designed to influence the judgments or the feelings of men, and therefore treats of everything that relates to beauty or force of style, such as accuracy of expression, the structure of periods, and figures of speech. But in a narrower sense rhetoric concerns itself with a consideration of the fundamental principles according to which particular discourses of an oratorical kind are composed. The first to reduce oratory to a system were the Sicilian Greeks; its actual founder is said to have been Corax of Syracuse (466 B. C.). He divided the speech into five parts, proem, narrative, arguments, subsidiary remarks, and peroration; and he laid great stress on the rhetorical capabilities of general probability. Later masters of rhetoric were Tisias; Gorgias of Leontini, whose style was burdened with two much ornament and antithesis; Antiphon, the earliest of the so-called "Ten Attic Orators," and the first writer of speeches for others to deliver in court. The speeches given by his great pupil Thucydides throughout his history, and the orations of Andocides, second of the Ten, are severely free from the florid ornament of later days. Lysias was an orator rather than a rhetorician; Isocrates first thoroughly taught rhetoric, which he defined as the "science of persuasion," as a technical method and discipline. His most celebrated pupils were Hyperides, Speusippus, and Isæus. The great Demosthenes was a pupil of the last. His opponent, Æschines, and his contemporaries, Hyperides, Lycurgus, and Dinarchus complete the Ten. Anaximenes of Lampsacus composed the oldest extant manual of rhetoric, but the great classical work on this subject is the analytical masterpiece of Aristotle. According to him its function is not to persuade, but to discover the available means of persuasion in any subject. He regards it as the counterpart of logic.

He divides the three provinces of rhetoric thus: (1) Deliberative rhetoric, concerned with exhortation or dissuasion, and future time, its ends expediency and inexpediency; (2) forensic rhetoric, concerned with accusation or defense, and with time past, its ends justice and injustice; (3) epideictic rhetoric, concerned with eulogy or censure, and usually with time present, its ends being honor and disgrace, or nobleness and shamefulness.

Aristotle's method dominated the Peripatetic school, but later began to be modified by the florid influence of Asia, the originator of which was Hegesias of

Magnesia. The school of Rhodes followed more closely Attic models, and gained great fame through its conspicuous leaders Apollonius and Molon (100-50 B. C.). Hermagoras of Temnos (120 B. C.) composed an elaborate system which long retained its influence. Later rhetoricians were Dionysius of Halicarnassus, Longinus, Hermogenes, Apsines, Menander, Theon, and Aphthonius. Among the earliest Roman orators were Appius Claudius Cæcus (300 B. C.), Cato the Censor, Ser. Sulpicius Galba, Caius Gracchus, Marcus Antonius, and Lucius Licinius Crassus. The instructors in formal rhetoric were Greek, and the great masters of theoretical and practical rhetoric alike, Cicero and Quintilian, were both formed by Greek models. Throughout the Middle Ages rhetoric formed one of the subjects of the *trivium;* its leading authorities were Martianus Capella, Cassiodorus, and Isidorus. The subject reawoke with the revival of learning, and was taught regularly in the universities, the prescribed public exercises and disputations keeping it long alive; but in later generations it has constantly languished. In the United States, however, considerable attention is paid to it as a branch of general education.

RHEUM, rhubarb; a genus of *Polygóneæ.* Calyx inferior, petaloid, six-partite; stamens about nine; ovary superior; ovule one, erect; styles three, reflexed; stigma, peltate, entire; achenium three-angled, winged, with the withered calyx at the base. *R. rhaponticum* is the common, or garden rhubarb. It is used in the United States in the making of pies, and is often called pie plant. *R. officinale,* or *R. palmatum,* is the officinal rhubarb. *R. emodi,* in the Punjab Himalaya, from 6,200 to 14,000 feet, with *R. moorcroftianum* and *R. speciforme,* are the chief sources of the Himalayan or Indian officinal rhubarb. It is less active than the common kind. The stalks of *R. emodi* are eaten by the Hindus. Other Indian species are *R. webbianum, R. nobile, R. arboreum,* which yields so much honey that the ground under the plants is wet with it, and *R. cinabarinum,* said to poison goats in Sikkim. *R. undulatum* grows in China and Siberia. The roots of *R. ribes* are used by the Arabs as an acidulous medicine, and its leaf-stalks in the preparation of sherbet.

In pharmacy, three leading kinds of rhubarb are recognized: (1) The Turkey or Russian rhubarb, which is wild neither in the one country nor the other, but used to be brought from China via Turkey, and then from China via Russia; (2) the East Indian, and (3) the Batavian rhubarb. An extract, an infusion, a syrup, a tincture, and a wine of rhubarb, with a compound rhubarb pill, are used in pharmacy. In small doses rhubarb is stomachic and slighty astringent; in large doses, a purgative, but its action is followed by constipation.

RHEUMATISM, a term which has been and still is, rather vaguely and extensively used in the nomenclature of disease. But there is one very definite affection to which it is always applied; after this has been discussed the other senses in which it is used will be considered.

Acute rheumatism or rheumatic fever is indicated by general febrile symptoms, with redness, heat, swelling, and usually very intense pain, in and around one or more (generally several, either simultaneously or in succession) of the larger joints, and the disease shows a tendency to shift from joint to joint or to certain internal serous membranes, especially the pericardium and the endocardium; rheumatism being the most common origin of pericarditis, as has been already shown in the article on that disease.

The usual exciting cause of acute rheumatism is exposure to cold, and especially to cold combined with moisture, and hence the greater prevalence of this disease among the poor and ill-clad. Rheumatism is not, however, a universal sequence of exposure to the cold. It only occurs when there is a special predisposition, or, as it is termed, a rheumatic diathesis or constitution, and the diathesis may be so strongly developed as to occasion an attack of acute rheumatism, independently of exposure to any apparent exciting cause. Men are more subject to the disease than women, but this probably arises from their greater exposure to atmospheric changes on account of the nature of their occupations. The predisposition is certainly affected by age; children under 10 years being comparatively seldom attacked, while the disease is most prevalent between the ages of 15 and 40. Above this age a first attack is rare, and even recurrences are less frequent than earlier in life. Persons once affected become more liable to the complaint than they previously were. The disease is hereditary in a considerable proportion of cases. The exact nature of the disease poison is unknown.

In the great majority of cases acute rheumatism ends in recovery; and permanent damage to the affected joints is rare. It is, however, extremely apt to recur, either in the early stages of convalescence, or after an interval of months or years. The chief danger

arises from implication of the heart, which frequently occurs. The younger the patient the greater the liability to these complications, which usually result in more or less permanent impairment of the heart's action. Another condition, much less common, but extremely fatal, is known as rheumatic hyperpyrexia, and is characterized by a very rapid rise of temperature to 108° or 110°, with head symptoms in the form either of drowsiness or of violent delirium.

The patient should be strictly confined to bed between blankets (*i. e.*, without sheets), and be clothed in flannel; he must be carefully protected from draughts, and from undue pressure of the bed clothes, and supplied with light nourishment and diluent drinks. Under such conditions, without other treatment, most cases recover in the course of time. Till the last quarter of the 19th century there was no general agreement as to what more should be done. In 1876 Stricker in Berlin and Maclagan in England called attention to a new method of treatment. This method consists in the administration of salicin, or of one of its derivatives (salicylic acid, salicylate of soda, etc.). In rheumatic hyperpyrexia the only treatment that has been found effectual is immersion in a tepid bath as often as the temperature rises to a dangerous point. Convalescence is usually very slow, and it is necessary to keep the patient in bed and on low diet for some time after the fever has disappeared to diminish the tendency to relapse. At this stage tonics, especially quinine and iron, are generally useful.

Chronic Rheumatism.—Chronic painful affections of the joints sometimes follow rheumatic fever and are clearly a consequence of it. The name is often erroneously applied to chronic and insidious forms of gout. There is another form of disease to which most of the cases of so-called "chronic rheumatism" belong, probably distinct from both rheumatism and gout, popularly so called, though it is often called "rheumatic gout," which deserves separate mention.

Osteo-arthritis (chronic rheumatic arthritis and rheumatic arthritis are among its many other names) is characterized in most cases by a very chronic course, by pain and stiffness in one or more of the joints, with creaking on movement, and by destructive changes of the cartilages of the affected joints, with enlargement of the ends of the bones in their neighborhood. It is more common in women than in men; most often begins at or after middle life, though occasionally even in childhood.

Muscular rheumatism is the name usually given to painful affections of the muscles for which no clear cause is discoverable.

RHINE (German, *Rhein;* Dutch, *Rijn*), the finest river of Germany, and one of the most important rivers of Europe, its direct course being 460 miles and its indirect course 800 miles (about 250 miles of its course being in Switzerland, 450 in Germany, and 100 in Holland); while the area of its basin is 75,000 square miles. It is formed in the Swiss canton Grisons by two main streams called the Vorder and Hinter Rhein. The Vorder Rhein rises in the Lake of Toma, on the S. E. slope of the St. Gothard, at a height of 7,690 feet above the sea, near the source of the Rhône, and at Reichenau unites with the Hinter Rhein, which issues from the Rheinwald Glacier, 7,270 feet above sea-level. Beyond Reichenau, which is 7 miles W. of Coire, the united streams take the common name of Rhine. From Coire the Rhine flows N. through the Lake of Constance to the town of that name, between which and Basel it flows W., forming the boundary between Switzerland and Germany. At Basel it turns once more to the N. and enters Germany; and, generally speaking, it pursues a N. course till it enters Holland, below Emmerich, when it divides into a number of separate branches, forming a great delta, and falling into the sea by many mouths. The chief of these branches are the Waal and Lek, which unite with the Maas; the Yssel and Vecht, which diverge to the Zuyder Zee; and that which retains the name of Rhine, a small stream that passes Leyden and enters the North Sea. In the German part of its course the chief tributaries it receives on the left are the Ill, Nahe, Moselle (with the Saar), Ahr, and Erft; and on the right the Neckar, Main, Lahn, Sieg, Ruhr, and Lippe. In Switzerland its tributaries are short and unimportant, and this part of its course is marked by the Falls of the Rhine at Schaffhausen, where the river is precipitated in three leaps over a ledge of rocks 48 to 60 feet in height, and by the cataracts of Lauterberg and the rapids of Rheinfelden. The chief towns on its banks are Constance and Basel in Switzerland; Spires, Mannheim, Mainz, Coblentz, Bonn, Cologne, and Düsseldorf, with Worms and Strasburg not far distant, in Germany; Arnheim, Utrecht, and Leyden, in Holland. Its breadth at Basel is 750 feet; between Strasburg and Spires from 1,000 to 1,200 feet; at Mainz, 1,500 to 1,700 feet; and at Emmerich, where it enters the

Netherlands, 2,150 feet. Its depth varies from 5 to 28 feet, and at Düsseldorf amounts even to 50 feet. It abounds with fish, especially pike, carp, and other white fish, but the produce of its salmon fisheries has been seriously interfered with since the introduction of steam vessels. It is navigable without interruption from Basel to its mouth, a distance of 550 miles.

The Rhine anciently formed the boundary between the Roman empire and the Teutonic hordes. After the partition of the domains of Charlemagne in 843 it lay within the German empire for nearly 800 years. France long cast covetous eyes on the Rhine, and the Peace of Westphalia in 1648 gave her a footing on the left bank. In 1801 the whole of the left bank of the Rhine was formally ceded to France. The Congress of Vienna in 1815 restored part of the Rhenish valley to Germany, and the cession by France of Alsace and Lorraine after the war of 1870-1871 made the Rhine once more German, until the Peace Treaty of Versailles (1919) gave these provinces once more to France. (See WORLD WAR.) The Rhine is distinguished by the beauty of its scenery, which attracts many tourists. For a large part of its course it has hills on both sides at less or greater distances. Pleasant towns and villages lie nestled at the foot; above them rise rocky steeps and slopes clothed at one time with vines, at others with natural wood, and every now and then the castles and fastnesses of feudal times are seen frowning from precipices apparently inaccessible. The finest part for scenery is between Bingen and Bonn; after entering Holland the views are generally tame and uninteresting.

RHINELANDER, a city of Wisconsin, the county-seat of Oneida co. It is on the Wisconsin river, and on the Chicago and Northwestern and the Minneapolis, St. Paul, and Sault Ste. Marie railroads. The city is the center of an important lumbering region and its industries include saw mills, paper mills, iron works, etc. Pop. (1910) 5,637; (1920) 6,654.

RHINELANDER, PHILIP MERCER, an American Protestant Episcopal bishop, born at Newport, R. I., in 1869. He was educated at Harvard and Oxford universities and became a deacon of the Protestant Episcopal Church in 1896, and a priest in 1897. After some years of active parish work in Washington, D. C., he became professor of ecclesiastical history, homiletics, and Christian evidences at Berkeley Divinity School, Middletown, Conn., in 1903, and professor of history of religion and missions at the Episcopal Theological School, Cambridge, Mass., in 1907. In 1911, he was consecrated coadjutor bishop of Pennsylvania, becoming bishop of the same diocese in November

PHILIP MERCER RHINELANDER

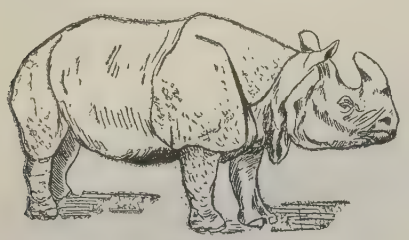
of that year. He received honorary degrees from the Episcopal Theological School of Cambridge, Mass., Philadelphia Divinity School, Columbia University, and the University of Pennsylvania.

RHINE WINES, the general designation of the wines produced in the region watered by the Rhine, and specifically for those of the Rheingau, the white wines of which are the finest in the world. The red wines are not so much esteemed, being considered inferior to those of Bordeaux. Good wines are also produced in the valleys of the Neckar, Moselle, and other tributaries of the Rhine. The vineyards are mainly between Mannheim and Bonn, and the most valuable brands of wines are those of Johannisberg, Steinberg, Hochheim, Rüdesheim, Rauenthal, Markobrunn, and Assmannshausen, the last being a red wine.

RHINITIS, nasal catarrh. In an acute form it is commonly known as a "cold in the head," and it is caused by bacilli attacking the mucous membrane of the nose when the resistance is lowered by cold or by mechanical irritants. Some chronic cases are caused by reflex irritation, resulting from over-stimulated sexual organs. Rhinitis is also a symptom of measles and occasionally accompanies other infectious diseases such as diphtheria or scarlet fever.

RHINOCEROS, (1) the sole recent genus of the family *Rhinocerotidæ*. It falls naturally into three sections, which some zoölogists raise to the rank of genera.

(a) *Rhinoceros.*—Adults with a single large compressed incisor above on each side, occasionally a small lateral one, below a very small median, and a very large procumbent, pointed, lateral incisor; nasal bone pointed in front; single nasal horn; skin very thick, and raised into strong, definitely arranged folds. There are two



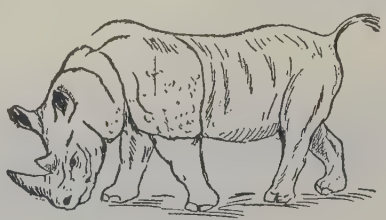
INDIAN RHINOCEROS

well-marked species: (1) *Rhinoceros unicornis* (Linnæus; *indicus*, Cuvier), now found wild only in the terai regions of Nepal and Bhotan and in Assam, though it had formerly a much wider geographical range; (2) *R. sondaicus* (or *javanus*, Cuvier), the Javan rhinoceros, is smaller and distinguished by the different arrangement of the folds of the skin, and by the small size or absence of the horn in the female. Found near Calcutta, in Burma, Malay Peninsula, Java, Sumatra, and probably Borneo. *R. unicornis* was known to the ancients, and was seen probably for the first time by modern Europeans when one was sent to the King of Portugal from India in 1513.

(b) *Ceratorhinus.*—The folds are not so strongly marked as in the first section. There is a well-developed nasal, and a small frontal horn, separated by an interval. The name, *R. sumatrensis*, has possibly been applied to more than one species, and two animals in the Zoölogical Gardens, Regent's Park, London, presented considerable differences of form and color. Sclater named one of them *R. lasiotis*, the hairy-eared rhinoceros. Geographical range nearly the same as that of the Javan rhinoceros, but it does extend into Bengal.

(c) *Atelodus*, with two well-marked species, peculiar to Africa. Incisors rudimentary or wanting, well-developed anterior and posterior horns in close contact; skin without definite permanent folds. *R. bicornis*, the common two-horned rhinoceros, is the smaller, and has a pointed prehensile lip. It ranges from Abyssinia to Cape Colony, but the progress of civilization and the attacks of sportsmen are rapidly reducing its numbers. Two varieties are said to exist, *R. bicornis major* and *R. bicornis minor*. Specimens in which the posterior horn has attained a length as great as or greater than the anterior have also been separated under the specific name of *R. keitloa*, but with scarcely sufficient reason. *R. simus*, Burchell's, the square-mouthed,or white rhinoceros, has a square truncated lip, browses on grasses and frequents open country. It is the largest of the family, an adult male standing over six feet at the shoulder. The epithet white is a misnomer, for the animal is a dingy slate-color. A local variety in which the horn has a forward rake is sometimes described as *R. oswellii*.

(2) Any individual of the genus rhinoceros. The rhinoceros is the largest and most powerful terrestrial mammal, except the elephant, to which, as well as to the hippopotamus and tapir, it is allied. They are of low intelligence, and usually harmless, but when provoked they display considerable ferocity, and, though apparently so clumsily formed, can run with great speed. Only one is produced at a birth. The flesh is sometimes used for food; in the East Indies, the skin, which is said to be bullet-proof at short



AFRICAN RHINOCEROS

distances, is used for shields, and in South Africa it is made into whips. *R. pachygnathus*, from the Miocene of Greece, was apparently intermediate between *R. bicornis* and *R. simus*. Four species, all bicorn, formerly inhabited Britain: *R. tichorhinus*, the woolly rhinoceros, from the brick-earths of the Thames valley; *R. hemitæchus* (Falc., *leptorhinus*, Owen), *R. megarhinus* (*leptorhinus*, Cuvier and Falc.), and *R. truscus*, of Pliocene age. The one-horned Indian type was well represented (*R. sivalensis*, *R. palæindicus*) in the Pleistocene of the sub-Himalayan region. *R. schleirmacheri*, of the late European Miocenes, possessed incisors and was bicorn.

RHINOPLASTIC OPERATIONS, When a portion or the whole of the nose has been destroyed by accident or disease, the deficiency may be restored by a transplantation of skin from an adjoining healthy part.

RHIO, or RIOUW, a seaport belonging to the Dutch, in the Indian Archipelago, on an islet 50 miles S. E. of

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Singapore. It consists of a European town, and a Chinese or native town, and having a capacious haven where large vessels find anchorage, carries on a considerable trade. It is the capital of a Dutch residency, comprising the islands of the Rhio Archipelago and other groups as well as districts on the E. coast of Sumatra. The population of the residency is about 108,000. The Rhio Archipelago is a group of small islands lying chiefly S. and E. of Singapore. Chief island, Bintang.

RHIZOPODA, a name introduced by Dujardin for an order of infusoria, which were defined as animalcules in mutable form, moving by means of multiform exsertile processes, without vibratile cilia or other external organs. When the subkingdom Protozoa was formed, the name Rhizopoda was retained for the class containing individuals with the power of emitting pseudopodia, and the class was divided into five orders: *Monera, Amœbea, Foraminifera, Radiolario,* and *Spongida.* The rhizopoda are the Myxopodia of Huxley, and this latter name has been retained by Professor Lankester in his reclassification of the Protozoa.

RHODE ISLAND, a State in the North Atlantic Division of the North American Union; bounded by Massachusetts, Connecticut, Narragansett Bay, Block Island Sound, and the Atlantic ocean; one of the original 13 States; capital, Providence; number of counties, 5; area, 1,248 square miles; pop. (1910) 542,610; (1920) 604,397.

Topography.—The State is divided into two unequal parts by Narragansett Bay, which extends inland about 30 miles. The surface of the W. portion or mainland is hilly, but the hills are all low; the greatest height, Durfee Hill, having an altitude of 805 feet. There are numerous salt marshes along the ocean. The E. part consists mainly of islands. Of these the largest and most important is Rhode Island from which the State derives its name. Others are Conanicut, Hope, Patience, Starved Goat, Prudence, Perry, Dyer's, and Dutch Islands. The principal rivers are the Pawtucket, navigable as far as Pawtucket, where it changes its name to Blackstone, the Pawcatuck, forming part of the boundary between Rhode Island and Connecticut, and the Pawtuxet, flowing across the central part of the State, and emptying into the Providence river, an arm of the Narragansett Bay. There are numerous coves and bays branching off from Narragansett; among them being Greenwich bay, Saxonnet river, Mount Hope bay, and Providence river. Block Island, 10 miles from the coast, belongs to the State.

Geology.—The islands of Narragansett bay are of Carboniferous origin and contain the most extreme bed of anthracite in the United States. The W. part of the State and the E. shore of the bay are of Azoic formation, while Block Island belongs to the Tertiary era. The mineral resources of the State are not very extensive, though considerable anthracite coal, excellent for smelting purposes, and much magnetic iron have been mined at times. There are about 20 large granite quarries in the State; those at Westerly being noted for their value in monumental work. The value of the mineral product is about $1,000,000 annually.

Manufactures.—In common with New England States, Rhode Island is noted for its manufacturing interests. In 1914 there were 2,190 manufacturing establishments, employing 113,425 wage-earners. The capital invested was $308,444,563. The value of the materials used amounted to $162,425,219, and the value of the output was $279,545,873. Rhode Island is among the first of the States in the dyeing industry. It is also among the leading States in the production of cotton, woolen, worsted, and silk goods. The manufacture of rubber and elastic goods is also an important industry.

Agriculture.—The acreage, production, and value of the principal crops in 1919 was as follows: corn, 11,000 acres, production 495,000 bushels, value $921,000; hay, 57,000 acres, production 86,000 tons, value $2,752,000; potatoes, 5,000 acres, production 425,000 bushels, value $765,000.

Banking.—On Sept. 12, 1919, there were 17 National banks in operation, having $5,570,000 in capital, $4,442,000 in outstanding circulation, and $9,929,000 in United States bonds. There were also 3 State banks, with $520,000 capital and $6,066,000 resources; 14 loan and trust companies, with $8,528,000 capital, and $10,562,000 surplus; and 15 mutual savings banks, with $101,259,647 in deposits. The exchanges at the United States clearing house at Providence for the year ending Sept. 30, 1919, amounted to $555,301,000.

Education.—There were in 1919 2,093 public elementary schools, 2,585 teachers, and 82,300 enrolled pupils. There were 163 high schools, with 8,756 pupils. The total expenditure for educational purposes is about $4,000,000 annually. Under the control of the Department of Education are the School of Design, Providence, and the Institute for the Deaf, Providence. The Rhode Island Normal School, and Brown University, at Providence, are the principal educational institutions in the State.

Churches.—The strongest denominations

in the State are the Roman Catholic; Regular Baptist; Protestant Episcopal; Congregational; Methodist Episcopal; Free Will Baptist; Unitarian, and African Methodist.

Railroads.—The railway mileage in 1919 was 550. Practically all of this was included in the lines of the New York, New Haven, and Hartford railroads. There was no new construction during the year.

Finances.—The receipts for the fiscal year 1919 amounted to $5,321,722. There was on hand at the beginning of the year $496,240. The total disbursements amounted to $5,142,533, leaving a balance on hand on January 1, 1920, of $675,429. The net bonded debt of the State in 1920 was $6,410,140. The total assessed value of the property was $850,000,000.

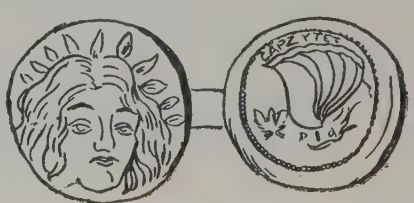
Charities and Corrections.—The institutions under the control of the State include a hospital for mental diseases, an infirmary, a workhouse, houses of correction, State Prison, and a reform school, all at Cranston. The Exeter School for the Care of Feeble Minded Children is under the control of the Penal and Charitable Commission. There is also under control of this board, a State Home and School for Children, at Providence.

State Government.—The governor is elected for a term of one year. Legislative sessions are annually, beginning on the first Tuesday in January and are limited to 60 session days. The Legislature has 39 members in the Senate, and 100 members in the House. There are 3 Representatives in Congress.

History.—It is claimed that the Northmen visited this region about A. D. 1000, and certain antiquities have been ascribed to them, but the question of the location of Vinland seems never likely to be definitely settled. The first English settlement was made at Providence in 1636 by Roger Williams, whose religious opinions had caused his expulsion from Massachusetts. He and other settlers bought lands from the Indians, and an unwonted degree of religious toleration was established. The charter granted by Charles II. to the colony was so liberal in its provision that it remained the fundamental law of the State till 1842. Rhode Island was firm in opposition to the King Philip War, yet that State suffered more severely therefrom than any of her sister colonies. King Philip himself was killed in what is now the town of Bristol. The great "swamp fight" occurred in 1675, in the Narragansett country, where more than 1,000 Indians were killed. The charter was temporarily suspended from 1686 to 1687 by Sir Edmund Andros, who, however, was never able to gain possession of the original document. Andros was deposed in 1690, and a new government was immediately organized under the old form. This continued till, in 1841, a legally unauthorized people's convention met and framed a new constitution which action precipitated a crisis, culminating in the "Dorr rebellion," and the adoption of a new constitution in 1842, this going into effect in 1843. Under this charter suffrage was limited, about 9,500 men composing the electorate in 1840, out of a population of 109,000. The present suffrage laws were adopted in 1888. Rhode Island was the last of the States to ratify the Federal Constitution in 1790. It took an active part in the Revolutionary War, being long held by the English.

RHODE, PAUL PETER, an American Roman Catholic bishop, born in Prussian Poland in 1871. Having come to America with his parents in his early childhood, he was educated at St. Mary's, St. Ignatius, and St. Francis colleges, Chicago, and was ordained a priest in 1894. From 1896 to 1909 he was in charge of various churches in Chicago. In 1908 he was consecrated bishop of Barca, and in the same year auxiliary bishop of the Archdiocese of Chicago. From 1909 to 1915 he also served as vicar-general of the Archdiocese. In 1915 he was appointed bishop of the Green Bay (Wis.) diocese.

RHODES, an island in the Mediterranean, formerly appertaining to Asiatic Turkey, near the coast of Asia Minor; is 40 miles long, with a breadth of 21



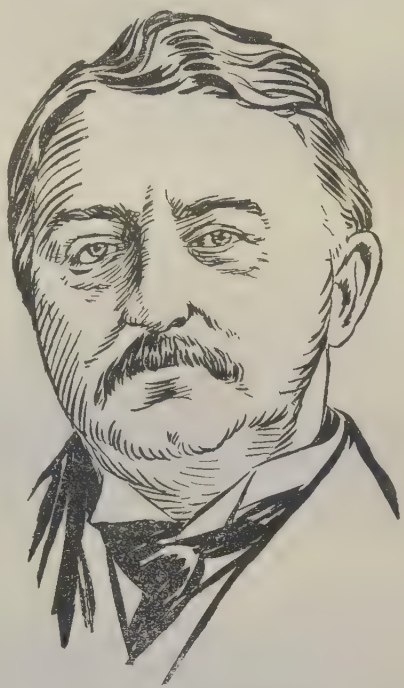
COIN OF RHODES

miles at its widest point; area, 570 square miles; pop. about 50,000. It is traversed by a range of mountains, on which grow forests of pine, in great request for shipbuilding. Beneath this range rises a tract of lower hills, on which a species of the vine is largely cultivated, which produces the perfumed wine so much praised by the ancients. The tract beneath forms the greatest portion of the island, and, sloping gradually down to the sea, is watered by numerous streams, which renders it capable of producing the most luxuriant crops. A great part of the island is uncultivated, but it yields corn, olives, pomegranates, lemons, wine, wax, honey and figs. The manufactures are silk,

shoes, red leather, and umber. Its exports are wax, honey, figs, and other fruits. Imports—colonial produce, woolens, iron, nails, shot, soap, cordage, hardware, coal, horses, cattle, carpets, and corn. By the terms of the Treaty of Peace with Turkey, Rhodes was assigned to Italy.

RHODES, the capital of the island of Rhodes, situated at its N. E. extremity. It is defended by towers about 800 feet distant from each other, while in the center of the mole there is a square bastion 120 feet high. Rhodes presents at present very few vestiges of its ancient grandeur; its streets are narrow and winding, and devoid of elegance or regularity. It has two good harbors, separated only by a mole running obliquely out into the sea. The principal manufactures are red leather and shoes. It was at the entrance to the harbor of this city that stood the celebrated COLOSSUS OF RHODES (*q. v.*). Pop. about 3,000. About half are Greeks; the rest Turks and Jews. The ancient Rhodes was taken possession of by a branch of the Doric race, who held it at the time of the Trojan War, 1184 B. C. It was of small political importance among the states of Greece till the city of Rhodes was built and made the capital of the island, 408 B. C. In the war between Cæsar and Pompey, the Rhodians, who had long held supremacy at sea, took part with the former 50 B. C.; and continuing their aid to Cassius, were defeated by the Romans and completely subjugated, 42 B. C. They then held their liberties by the caprice of the emperors, and their city was made, by Constantine I., the metropolis of the Provincia Insularum in 330. It was taken by Chosroes II., King of Persia, in 316; by the Saracens in 651; and by the Knights of St. John, Aug. 15, 1309. Mohammed II. besieged it ineffectually in 1480, and the Sultan Solyman I. compelled it to capitulate after a vigorous siege and brave defense that lasted from June to December, 1522. An earthquake which occurred in Rhodes, April 22, 1863, destroyed 2,000 houses, and swallowed up or otherwise killed and wounded thousands of the inhabitants.

RHODES, CECIL JOHN, a South African statesman; born July 5, 1853. He was the fifth son of the vicar of Bishop Stortford, Hertfordshire, England, and after attending the local grammar school was sent for his health to Natal, where his brother was a planter. He subsequently went to the Kimberley diamond diggings; there he soon became conspicuous and amassed a fortune. He came back to England and entered at Oriel College, Oxford, and though his residence was cut short by ill-health, he ultimately took his degree. He entered the Cape House of Assembly as member for Barkly. In 1884 General Gordon asked him to go with him to Khartum as secretary; but Rhodes had just taken office in the Cape ministry, and decided to remain in South Africa. He sent $50,000 to Mr. Parnell to



CECIL JOHN RHODES

forward the cause of Irish Home Rule. In 1890 he became prime minister of Cape Colony; but even before this he had become a ruling spirit in the extension of British territory, and in securing the charter for the British South African Company. His policy may be described as the ultimate establishment of a federal South African dominion under the British flag, and, as one of the first steps toward the accomplishment of this scheme, he was an earnest advocate of the construction of a railroad "from Cairo to the Cape." He died in Cape Town, South Africa, March 26, 1902. In his will Mr. Rhodes left about $10,000,000 to found a number of three-year scholarships tenable at Oxford, England. The income for each scholarship was $1,500 a year, and two were offered to every State and Territory in the American Union, to every English-speaking colony; while five were set apart for students of German descent. See RHODESIA.

RHODES, CHARLES DUDLEY, an American military officer, born at Delaware, Ohio, in 1865. He was educated at the George Washington University, and the United States Military Academy, from which he graduated in 1889. After having been appointed in the same year 2nd lieutenant in the 7th Cavalry, he successively rose through the various ranks, to major-general in 1918. He served in the Sioux Indian Campaign of 1890–1, in the Spanish-American War, in the Boxer (China) Relief Expedition, in the Philippine Islands (1900–1903), and in the World War, in which he commanded the 157th Field Artillery Brigade during the Aisne-Marne, the St. Mihiel, and the Meuse-Argonne offensives. Later he commanded the 42nd and 34th Divisions, served as chief of the American section of the Permanent Interallied Armistice Commission (1918–19), and as commanding general of Base Section 2 at Bordeaux, France. In 1919–20 he was in command of the General Staff College. From 1903 to 1906, and again from 1909 to 1912, he was assigned to duty with the General Staff Corps, and from 1914 to 1917 commanded the Mounted Service Schools. He was awarded the D. S. M. and was made a Knight Commander of the Bath, and a Commander of the Legion of Honor. He wrote and lectured extensively on military subjects.

RHODES, HARRISON (GARFIELD), an American author, born in Cleveland, Ohio, in 1871. He was educated at Harvard, and for a number of years was actively engaged in the publishing business, both in this country and in England. Besides many stories and articles in magazines, he also wrote "The Lady and the Ladder" (1906); "Charles Edward" (1907); "The Flight to Eden" (1907); "In Vacation America" (1915). Among his plays were "Modern Marriage," "The Whirl of Society," "Ruggles of Red Gap," "The Willow Tree" (with Benrimo), "A Gentleman from Mississippi," "An Old New Yorker," and "Mr. Barnum," the last three with Thomas A. Wise.

RHODES, JAMES FORD, an American historian; born in Cleveland, O., May 1, 1848. He was educated at the Universities of New York and Chicago; spent some years in study abroad, and engaged in business till 1891. He wrote "History of the United States from the Compromise of 1850" (new ed. 1906); "Historical Essays" (1909); "History of the Civil War" (1917); "History of the United States, 1877–1896" (1919), etc. He was awarded the Loubat Prize from Berlin Academy of Science, 1901; gold medal National Institute of Arts and Letters, 1910; Pulitzer Prize, Columbia University, 1918; and many honorary degrees from American and foreign universities. He was an ex-president of the American Historical Society and a member of many domestic and foreign societies.

RHODES SCHOLARSHIPS, THE, fellowships for general study at Oxford University, England, established, to the number of 189, under the will of Cecil John Rhodes (*q. v.*) for the purpose of perpetuating, in so far as possible, the idea of dominant Anglo-Saxon leadership, by educating Anglo-Saxon youths of proper attainment. For this purpose the founder divided the allotment of students between South Africa, Australasia, Canada, the Atlantic Islands, the West Indies, the United States, and Germany. The United States received 96 scholarships. The arrangement for the election of the American scholars has been so settled as to provide for the election of scholars in 32 States each year and, in several of the States, the matter of designating the students has become established by rotation among the institutions of higher learning. The candidates are required to qualify in examinations covering Latin, Greek, and elementary mathematics. They must be men 20 to 25 years of age and must have attended a recognized institution of advanced educational standard for at least two years. In addition, a Rhodes scholar must be unmarried and a citizen of the United States to qualify for an appointment from the United States. The effect of these requirements has been to secure as incumbents of these scholarships men who have passed beyond the general age at which the English schoolboy enters his university. This has insured a more serious and mature type of man and when taken in connection with the rigorous personal qualifications demanded in the selection of candidates, it has been productive of a very high grade of scholarship and character among the students which may be expected to react in the form of social influence, somewhat approximating the desire which the donor expressed in his will when he said that it remained his belief that "a good understanding between England, Germany and the United States will secure the peace of the world, and that educational relations form the strongest tie." Awarded on a basis of points and taken from a unit of ten, the founder suggested the following significant standard: three-tenths for proficiency in literary and scholastic attainments; two-tenths for success in outdoor

sports; three-tenths for distinguishing qualities of manhood; two-tenths for qualities of leadership; and provided further with discriminating wisdom that the candidate's qualifications in literary and kindred lines and his qualities of leadership should be judged by his masters, but that the other characteristics of excellence in sport, with all that was thereby implied, and manliness, should be determined by the vote of his fellow-students. This system of selection has been followed.

RHODESIA, the name given to a region in South Africa extending from the Transvaal province north to the borders of the Congo State and former German East Africa; bounded on the E. by Portuguese East Africa, Nyasaland and German East Africa, and on the W. by Congo State, Portuguese West Africa and Bechuanaland. The territory was chartered by the British South African Company in 1889, founded by Cecil John Rhodes. The region S. of the Zambesi river is known as southern Rhodesia and N. of the river northern Rhodesia. Total area, 440,000 square miles. Population in 1919 estimated from 877,000 to 884,000. The company's administration of southern Rhodesia consists of 3 members appointed by the company and approved by the Secretary of State, and a Legislative Council of 6 members appointed by the company and 12 elected by the voters. A Resident Commission is appointed by the Secretary of State. In 1919, 500,000 acres of land were reserved for ex-service men who had fought in the World War.

Southern Rhodesia has an area of 149,000 square miles. Pop. (1919): Natives 770,000, Europeans 38,000. Capital, Bulowayo. Imports (1918) £355,712; exports, £343,338. Gold output in 1919, £2,500,000; silver (1917), £211,989; copper, £414,448; chrome ore, £327,347. There are about 2,500 miles of railroads. In 1911 the two provinces of Northeast Rhodesia and Northwest Rhodesia were amalgamated under the name of Northern Rhodesia. Area, 291,000 square miles. Pop., Europeans 2,945, natives 928,000. Capital, Livingston. Principal crops, maize, cotton, and wheat. Coal has been discovered. Rubber is produced. The chief minerals are gold, copper and lead. The administration consists of a Resident Commissioner appointed by the government and an Administrator appointed by the British South African Company, assisted by an Advisory Council of 5 members. The exports consist chiefly of live-stock, copper, pig-lead, grain, flour, hides, horns, etc. Throughout the country the conditions of soil and climate are suitable for all kinds of European cereals and vegetables; and, in addition, many trees, shrubs, and plants peculiar to subtropical regions, can be successfully cultivated. Good results have already been obtained from the introduction of fruit and other trees. Tobacco occurs in a wild state, is grown universally by the natives, and has been produced of excellent quality by white farmers in several districts. India-rubber, indigo, and cotton are similarly indigenous. The Rhodesian forests produce abundance of hard timber of fine quality. The vast territory adjacent to the headwaters of the Zambesi and its tributaries forms the Mississippi valley of Africa. It has a great future.

RHODINOL, C_{10} H_{20} O, the odorous constituent of oil of roses. It is also said to occur in oil of ginger grass, lemon oil and some others. It is a colorless, oily liquid, boiling at 110° C., specific gravity 0.88. Its chief use is in the manufacture of perfumes.

RHODIUM, one of the rare metals found in platinum ores. It is very hard, white, and brittle, and, with the exception of iridium, one of the most infusible of metals. When pure, it is insoluble in acids, but when alloyed with platinum, bismuth, or copper, it is dissolved with them in aqua regia. Heated in contact with chloride of sodium in a current of chlorine, the double chloride of rhodium and sodium is formed. The only use to which rhodium has been applied, is to form the nibs of metallic pens. Rhodium was discovered by Wollaston in 1803, associated in small quantity with native platinum.

RHODODENDRON, a genus of trees and shrubs of the natural order *Ericaceæ*, having 10 stamens, a very small calyx, and a bell-shaped or somewhat funnel-shaped corolla. The buds in this and nearly allied genera, as azalea, are scaly and conical. The species are numerous; they have evergreen leaves, and many of them are of great beauty, both in foliage and in flowers. A few small species are natives of continental Europe and of Siberia; but the greater number belong to the temperate parts of North America, and to the mountains of India. *R. maximum*, so designated when the far larger Indian species were unknown, is common in North America as an ornamental shrub. It is a large shrub or small tree, which forms impenetrable thickets on many parts of the Allegheny mountains. The leaves are large, leathery, dark green and shining above, rusty brown beneath. The flow-

ers are large, varying in color from pale carmine to lilac. This species is quite hardy in Great Britain; as is also *R. ponticum*, a very similar species, with narrower and more pointed leaves, which are of the same color on both sides, a native of western Asia, and apparently also of the S. of Spain. *R. catawbiense*, a native of the S. parts of the Alleghenies, with large purple flowers; *R. Caucasicum*, the name of which indicates its origin; and *R. arboreum*, a native of Nepal, with very dense heads of large scarlet flowers. Most of the

RHODODENDRON

extremely numerous varieties now common in our gardens and shrubberies have been produced from them by hybridizing or otherwise.

Many splendid species of rhododendrons were discovered in the Himalayas, the Khasia hills, and other mountainous parts of India, and have been introduced into cultivation in Europe. *R. Falconeri* is described as in foliage the most superb of all, the leaves being 18 or 19 inches long. It is a tree 30 to 50 feet high, with leaves only at the extremities of the branches. It grows in eastern Nepal at an altitude of 10,000 feet. *R. argenteum* has flowers 4½ inches long, and equally broad, clustered, and very beautiful. *R. Maddeni*, *R. Aucklandii*, *R. Edgeworthii*, and others have white flowers. *R. Dalhousiæ* is remarkable as an epiphyte, growing on magnolias, laurels, and oaks. It is a slender shrub, bearing from three to six white lemon-scented bells, 4½ inches long, at the end of each branch. *R. Nuttali* has fragrant white flowers, said to be larger than those of any other rhododendron. All these belong to the Himalayas. In more southern latitudes, as on the Neilgherry Hills and on the mountains of Ceylon, *R. nobile* prevails, a timber tree 50 to 70 feet high, every branch covered with a blaze of crimson flowers. *R. Keysii* and *R. Thibaudiense*, also natives of the N. of India, have flowers with nearly tubular corolla. *R. ferrugineum* and *R. hirsutum* are small species, natives of the Alps. They are called *Alpenrose* (Alpine rose) by the Germans. They have small carmine-colored flowers. The flora of the Himalayas contains a number of similar small species. *R. anthopogon* and *R. setosum*, dwarf shrubs with strongly scented leaves, clothe the mountains in eastern Nepal. *R. nivale* is the most alpine of woody plants, spreading its small woody branches close to the ground at an elevation of 1,700 feet in Sikkim. *R. lapponicum*, a procumbent shrub, with small flowers, grows as far N. as human settlements have reached in Europe, Asia, and the United States. An oil obtained from the buds of *R. ferrugineum* and *R. hirsutum* is used by the inhabitants of the Alps, under the name *Olio di Marmotta*, as a remedy for pains in the joints, gout, and stone. *R. chrysanthum*, a low shrub, with golden yellow flowers, a native of Siberia, is also used in gout and rheumatism. *R. cinnabarinum*, a Himalayan species, poisons goats which feed on it. But the flowers of *R. arboreum* are eaten in India, and Europeans make a palatable jelly of them.

RHOMB, or **RHOMBUS**, in geometry, an oblique parallelogram whose sides are all equal. The diagonals of a rhombus bisect each other at right angles. The area of a rhombus is equal to half the product of its diagonals.

Fresnel's rhomb, in optics, is an apparatus for converting plane into circularly polarized light. It is a parallelopiped of glass, of such length and angles that a ray of light entering one small end at right angles, twice suffers total reflection within the rhomb at an angle of about 54° (depending on the polarizing angle of the glass), and finally emerges at right angles from the opposite small end. When the beam of light is plane polarized, and the rhomb is so arranged that its reflecting faces are inclined at an angle of 45° to the plane of polarization, the beam emerges circularly polarized.

RHONDDA, MARGARET HAIG MACKWORTH, VISCOUNTESS, a woman prominent in British enterprises, born in 1883. The daughter of G. A. Haig of Penithon, Radnorshire, she married in 1908 Sir Humphrey Mackworth.

She is chairman of the Sanatogen Company and director of the Anglo-Argentine Coal Co., Ltd., Cambrian Collieries, Ltd., Globe Shipping Co., Ltd., Solutaris Water Co., Ltd., S. Wales Printing and Publishing Co., Ltd., and is connected with many other industrial undertakings.

RHÔNE, a department of France, part of the former Lyonnais; area 1,104 square miles. Pop. about 915,500. It lies almost wholly in the basin of the Rhône and the Saône, its E. boundary being formed by these rivers. The surface is almost entirely hilly, being broken up in all directions by low spurs of the Cévennes. Corn, potatoes, wine, and fruits are the principal products. Nearly one-half the area is cultivated, one-eighth in vineyards, one-ninth under forest, and nearly one-sixth meadows. About 13,000,000 gallons of wine were made annually before the World War. The department is industrially one of the most important in France; all the branches are carried on at LYONS (*q. v.*), the capital of the department.

RHÔNE (Latin, Rhodănus), a river in Europe which rises in Switzerland, near the E. frontiers of the canton of Valais, about 18 miles W. S. W. of the source of the Vorder-Rhein. Its precise origin is the Rhône Glacier, 5,581 feet above the level of the sea. It passes through the Lake of Geneva, and enters France, flowing first S. and then W. to the city of Lyons, where it turns almost due S., and so continues till (after passing Avignon and Arles) it falls into the Gulf of Lyons by a greater and smaller mouth, forming here an extensive delta. Its principal affluent is the Saône, which enters it at the city of Lyons; other large tributaries are the Isère and Durance. Its whole course is about 500 miles; its drainage area is 38,000 miles; and it is navigable for 360 miles. The great obstacles to its navigation are the rapidity of its current, the shifting character of its channel, and the variations that take place in the volume of its water; but these obstacles have to a great extent been removed by a scheme of regularization and canalization, intended to secure everywhere a depth of over five feet. By means of a series of magnificent canals the navigation of the Rhône has been continued, without interruption, to the Rhine (through the Saône), Seine, and Loire, and to the Meuse and the Belgian system.

RHUS, in botany, a genus of *Anacardiaceæ*. Leaves simple or compound. Flowers in axillary or terminal panicles, bisexual or polygamous. Calyx small, persistent, five-partite; petals five; stamens five; ovary one-celled, sessile; fruit a dry drupe, with one exalbuminous seed. Nearly 100 species are known. Most are shrubs, from 6 to 10 feet high. They exist in all the continents. The leaves of *R. coriaria*, the hide or elm-leaved sumach of the S. of Europe, are used for tanning morocco leather. In the Himalayas those of *R. cotinus* are similarly employed. The fruit of the former was given in dysentery. In India, *R. parviflora*, *R. semialata*, *R. succedanea*, are used medicinally. Exudations from incisions in the bark of *R. succedanea* and *R. vernicifera* yield the varnish used in Japanese and Chinese wickerwork. The former produces astringent galls, and its seeds yield a kind of wax; as do also those of *R. wallichii* and the Japanese *R. vernix*. The juice of the latter species blisters the skin. The Turks used the acid fruits of *R. coriaria* to sharpen their vinegar. The plant yields sumach. The bark of *R. glabrum* is a febrifuge, and is employed as a mordant for red colors. *R. metopium*, a Jamaica plant, yields a medicinal gum. *R. toxicodendron* (used in pharmacy as a topical irritant) and *R. venenata*, American species, are poisonous, nor is any of the genus very safe. These two species are called indifferently poison oak, poison ivy, poison sumac, and more rarely mercury. The wood of *R. collinus* is employed for inlaid and cabinet work.

RHYME, more correctly RIME, in poetry, a correspondence in sound of the terminating word or syllable of one line of poetry with the terminating word or syllable of another. To constitute this correspondence in single words or in syllables it is necessary that the vowel and the final consonantal sound (if any) should be the same, or have nearly the same sound, the initial consonants being different. If the rhyme is only in the last syllables, as in forgave and behave, it is called a single rhyme; if in the two last syllables, as bitter and glitter, it is called a double rhyme; if in the last three syllables, as callosity and reciprocity, it is called a triple rhyme. Rhymes which extend to more than three syllables are almost confined to the Arabians and Persians in their short odes (gazelles), in which the same rhyme, carried through the whole poem, extends sometimes to four and more syllables. The modern use of rhymes was not known to the Greeks and Romans; though some rhymed verses occur in Ovid. It has been used, on the other hand, from time immemorial among the Chinese, Hindus, Arabs, and other Oriental nations. Rhyme began to be developed among the western nations in the

Latin poetry of the Christian Church. It is found used as early as the 4th century. The early English, German, and Scandinavian poems are distinguished by alliteration instead of rhymes.

RHYMER, THOMAS, of Erceldoune, or Earlston, Berwickshire, England, otherwise called THOMAS THE RHYMER; a half-legendary Scotch poet or romancer of the 13th century. He is mentioned by Barbour, Blind Harry, and Wyntoun, was credited with prophetical powers, and his "Prophecies," a collection of oracular rhymes, were long popular in Scotch folk lore. The old metrical romance of "Sir Tristram" is doubtfully ascribed to him.

RHYNCHONELLA, in zoölogy, the typical genus of *Rhynchonellidæ*. Shell trigonal, acutely beaked, usually plaited; dorsal valve elevated in front; ventral flattened, or hollowed along the center. Known recent species four, from the North Polar regions and New Zealand. Known species 332, from the Lower Silurian onward. Found in Europe, Asia, and North and South America.

RHYOLITE, also known as Liparite and Nevadite, a group of volcanic rocks, containing a high percentage of silica, and possessing in many cases a vitreous character. The name Liparite is derived from the Lipari Islands, where quantities of Rhyolites are found.

RHYS, ERNEST, an English editor and writer, born in London, in 1859. He was educated in the public schools in Wales and England, and became a mining engineer in 1877. He abandoned this career in 1885 to engage in writing and lecturing on literary subjects. He several times visited the United States, delivering lectures. He was the editor of the "Camelot Series" of reprints and translations, and also edited several of the Elizabethan dramatists. He was also editor of the "Everyman's Library" series. His writings include "Welsh Ballads and Other Poems" (1898); "The Fiddler of Carne" (1896); "The Whistling Maid" (1900); "Lyric Poetry" (1913); and "Rabindranath Tagore" (1915).

RHYS, JOHN (rīs), a Celtic philologist; born in Abercaero, Cardiganshire, Wales, June 21, 1840. He was Professor of Celtic in Oxford from 1877 and principal of Jesus College from 1895. He published "Lectures on Welsh Philology" (1877); "Celtic Britain" (1882); "Studies in the Arthurian Legends" (1891); "The Welsh People" (1901). He died in 1915.

RHYTHM, in general a measured succession of divisions or intervals in written composition, music, or dancing. The rhythm of poetry is the regular succession of accent, emphasis, or voice stress; or a certain succession of long and short (heavy and light) syllables in a verse. Prose also has its rhythm, and the only difference (so far as sound is concerned) between verse and prose is, that the former consists of a regular succession of similar cadences, divided by grammatical pauses and emphases into proportional clauses, so as to present sensible responses to the ear at regular proportioned distances. In music, rhythm is the disposition of the notes of a composition in respect of time and measure; the measured beat which marks the character and expression of the music.

RIAZAN, or RYAZAN, Russia, capital of the province of the same name, 120 miles S. E. of Moscow, situated on the Trubezh river. It was noted before the World War for the excellent cutlery produced in its factories and was also an important center of the textile industry. The population is about 48,000. The province of Riazan is drained by the Oka river, has an area of 16,254 square miles and a population of about 2,700,000.

RIB, in anatomy, one of the long curved bones which form the walls of the chest. They extend in an oblique direction from the vertebræ of the back to the sternum in front. There are usually 12 on each side; but in some rare cases 13 have been found, in others only 11. They are distinguished into "true" and "false"; the former being the seven upper ribs, which are articulated to the sternum; the latter the five lower ones, which are not immediately attached to that bone. The use of the ribs is to cover and defend the lungs and heart; and their articulations with the vertebræ and sternum admitting of a slight motion, they assist in respiration. See ANATOMY: THORAX. In shipbuilding, one of the timbers of a ship, which have their base in the keel as a backbone, and serve to maintain generally the cavity of the vessel. In architecture, one of the curvilinear timbers to which, in an arched or covered plaster ceiling, the laths are nailed. In botany, the principal vein or nervure which proceeds from the petiole into the blade of a leaf. In mining, a pillar of coal left for the support of the roof of a mine.

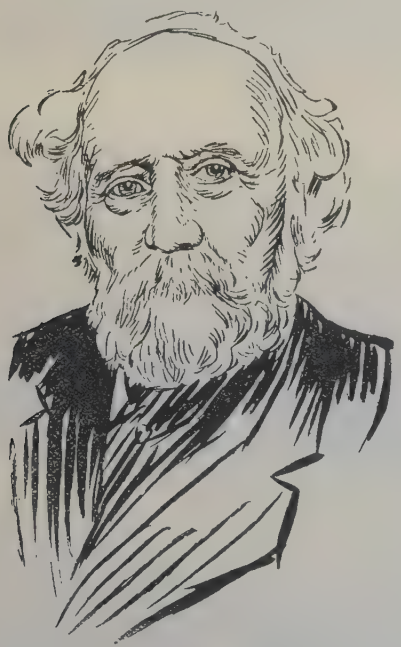
RIBBON FISH, the *Regalecus banksii*, known also as the oar-fish. Its length is about 12 feet; color, silvery, with irreg-

ular dark lines and spots on the anterior part of the body; dorsal red; snout truncated, mouth edentate, stomach prolonged as a pouch. Ribbon fishes, the acanthopterygian division Tæniiformes.

RIBBON GRASS, *Phalaris arundinacea,* a species of canary grass with variegated leaves.

RIBBONISM, the name assumed by a group of secret associations among the lower classes in Ireland throughout the half century extending from 1820–1870, at its greatest height from about 1835 to 1855. Its origin and organization are alike wrapped in obscurity, but it appears in the beginning at least to have been political in its aims, and it seems probable that it grew out of the northern Defenders who banded themselves to oppose the Orange organization. Earlier associations with somewhat similar aims were the Whiteboys and the Threshers, and, in particular corners of the island, the Carders, Shanavests, and Caravats.

RIBOT, ALEXANDRE FÉLIX JOSEPH, a French statesman. He was born at St. Omer in 1842 and was educated at the Lycée of St. Omer. He was admitted to the bar in 1864 and in 1870 became *substitut du tribunal de la Seine.* In 1878 he was appointed by M. Dufaure secretary-general of the ministry of justice and in the same year was elected to the Chamber of Deputies. In 1890 he became minister for foreign affairs in M. de Freycinet's cabinet and continued in that position for three years. During his tenure of office the alliance between France and Russia was concluded. He was president of the cabinet during the stormy period of the Panama case and became for the second time Prime Minister after the resignation of M. Casimir-Périer, and so continued till 1914. He was Minister of Finance during the greater period of the war, 1914–1917, and became premier again in the latter year. He has opposed the policy of retaliation against the religious orders and his most important speeches have been delivered on finance, foreign affairs, and the question of freedom in teaching. He is a member of the Académie Française et Académie des Sciences Morales et Politiques. His works include: "Life of Lord Erskine," "Réforme de l'enseignement secondaire," "Discours politiques."



ALEXANDRE F. J. RIBOT

RICARDO, DAVID, an English political economist; born in London, England, April 19, 1772. He stands next to Adam Smith (whose ideas he developed and systematized) in the British free-trade school of political science, and his writings have exerted a vast influence on all theories of political economy. After making his fortune in the Stock Exchange in London, he retired to devote himself to the study of mathematics, chemistry, etc. The first result of his studies was a tract entitled "The High Price of Bullion a Proof of the Depreciation of Bank Notes" (1809). In 1817 appeared his most important work, "The Principles of Political Economy and Taxation." Its leading feature was the theory of rent, now universally accepted—that it represents the surplus earning power of better or more favorably situated land over that just good enough to be worth utilizing. He published in addition a number of essays on economics. His "Works" were edited by MacCulloch (1846). His "Letters to Malthus" were published in 1887. He died in Gatcomb Park, Gloucestershire, Sept. 11, 1823.

RICASOLI, BARON BETTINO, an Italian statesman; born in Florence, March 9, 1809; studied at Pisa and Florence; was one of the best agriculturists in Italy; wrote books on the cultivation of the vine, the olive, and the mulberry, and for 10 years worked successfully at the drainage of the Tuscan Maremma. In 1859 he took a prominent part in opposing the government of the grand duke and when the latter fled Ricasoli was made dictator of Tuscany. He la-

bored with great energy for the unity of Italy, and when that end was accomplished was by Victor Emmanuel appointed governor-general of Tuscany. On the death of Cavour (1861) he was called to the head of the ministry; but his government was undermined by Rattazzi, and he resigned in March, 1862. Ricasoli returned to power in June, 1866, but was again obliged to retire in April of the following year. At the same time he withdrew altogether from public life. He died in Rome, Oct. 23, 1880. Five volumes of his "Letters and Papers" were published by Tabarrini and Gotti at Florence in 1886–1895.

RICE (*Oryza*), a genus of grasses. The only important species is the common rice (*O. sativa*), one of the most useful and extensively cultivated of all grains, supplying the principal food of nearly one-third of the human race. It seems to be originally a native of the East Indies, but is now cultivated in all quarters of the globe, and almost wherever the conditions of warmth and moisture are suitable. Rice is an annual, varying from one to six feet in height. There are many other distinguishing characters of the varieties in cultivation, some having long awns and some being awnless, some having the chaff (*palex*), when ripe, yellow, white, red, black, etc. The seed or grain of rice grows on little separate stalks springing from the main stalk; and the whole appearance of the plant, when the grain is ripe, may be said to be intermediate between that of barley and of oats. Rice requires a moist soil, sometimes flooded. In South Carolina rice is sown in rows in the bottom of trenches, which are about 18 inches apart; the trenches are filled with water to the depth of several inches, till the seeds germinate; then the water is drawn off, and afterward the fields are again flooded for rather more than a fortnight to kill weeds. They are flooded again when the grain is near ripening. In Europe the cultivation of rice is most extensively carried on in the plains of Lombardy and in Valencia in Spain. The introduction of rice into the United States took place only about the middle or close of the 17th century; but the date has been disputed, 1694 being the earliest year in which it is known to have been grown.

The wild rice, plentiful in the marshy tropical countries of southern Asia as well as in northern Australia, is without doubt the plant from which all our forms of cultivated rice have been derived. Most modern authorities regard India as the first home of rice, though some say it was originally derived from China. It has been cultivated in India from time immemorial. Four thousand apparently distinct forms of Bengal rice have been exhibited. There are 1,400 different specimens of rice in the Calcutta Museum. There are as many as 1,300 names of rice. The obvious differences in the grain itself are indeed very remarkable. In color the specimens range from a bright golden hue through almost every gradation of tint to black; and in regard to size also they vary greatly. But all these forms of rice are referable to a very few well-marked and constant varieties of *O. sativa*, the result of seminal variation commonly observed in plants that have been long brought under cultivation. The rice exported from India is divided broadly into three qualities: (1) table rice; (2) ballam, named after the boats in which it is carried; and (3) moonghy, common or inferior rice. Cargo rice is that in which only one part in five is husked. In 1919 the East suffered from a shortage in the rice crop. British India prohibited export. The Japanese rice crop was about 426,000,000 bushels, Korean about a fifth, the United States produced 41,059,000 bushels; the price to farmers, $2.67 a bushel. The principal rice-growing States are Louisiana, California, Texas and Arkansas.

In China rice is generally sown pretty thickly on very wet land, and afterward transplanted to the land which it is finally to occupy. In many parts of China and in other warm countries it is common to obtain two crops of rice in a year.

Rice is husked and quickly dried before being brought to market. Special milling machinery is required for removing the inner skin of the rice grain, and a large quantity of the grain is badly broken in the process, being salable only as broken rice or rice flour. Good Indian rice has the following composition: Moisture, 13.50 per cent.; nitrogenous matter, 7.41; starch, 78.10; fatty or oily matter, 0.40; ash, 0.59. Rice contains a smaller amount of nitrogenous elements than any other grain (wheat having as much as 22 per cent.); it is also deficient in fatty matter, and if taken by itself is less nutritious than other grain food; but combined with fatty nitrogenous substances it is a valuable foodstuff. The beer made from rice by the Japanese is called Saki, and is in general use among them. Several kinds of wine are made by the Chinese and Japanese from rice, some of them highly esteemed and very intoxicating; spirit is distilled from the lees. Some of the common arrack of the East is made from rice; and rice is also largely employed by distillers in Great Britain.

Rice starch is made in considerable quantity and is used in laundries and muslin manufactories. It has one-fourth more starch in its composition than wheat. The straw of rice is used to make straw plait for bonnets and the straw shoes of Japan. The refuse of rice is valuable as food for cattle. It is known as rice meal and rice dust.

Canada rice (*Zizania aquatica*), the wild rice or Indian rice of North America, is a species of grass quite different from the true rice, and of a different genus. It is common in North America, and particularly abundant in the N. W. parts, growing in miry places or shallow water, often on the margins of lakes. It has a culm seven or eight feet high, with broad diffuse leaves, and a large terminal panicle of male flowers, with a spike of female flowers at the summit. The flowers have six stamens. The seeds are about half an inch long, slender, farinaceous, and are much used by the Indians where the plant abounds.

RICE, ALEXANDER HAMILTON, an American explorer and geographer, born in Boston, Mass., in 1875. He was educated at Harvard, and although receiving a degree of M.D. in 1902, he later became interested in geography and exploration, studying from 1908 to 1910 at the School of Geographical Survey and Astronomy of the Royal Geographical Society, in London. He organized and conducted several expeditions to tropical South American countries. During the World War he served as surgeon at a military hospital in Paris, and at the American Ambulance at Neuilly. He was a member of several geographical societies in this country and abroad and was awarded the gold medal of the Royal Geographical Society in 1914. The results of some of his explorations and scientific investigations were published in the form of articles in the "Geographical Journal."

RICE, ALICE (CALDWELL) HEGAN, an American author, born in Shelbyville, Ky., in 1870. She was educated in private schools and gave much time and thought to philanthropic work, being one of the founders of the Cabbage Patch Settlement House, of Louisville, Ky. In 1902 she was married to Cale Young Rice (*q. v.*). Her books, some of which have met with very great success, include "Mrs. Wiggs of the Cabbage Patch" (1901); "Lovey Mary" (1903); "Sandy" (1905); "Captain June" (1907); "Mr. Opp" (1909); "A Romance of Billy Goat Hill" (1912); "The Honorable Percival" (1914); and "Calvary Alley" (1918). She also wrote numerous short stories. Some of her books have been translated into several languages, while others have been dramatized.

RICE, CALE YOUNG, an American poet and dramatist, born at Dixon, Ky., in 1872. He was educated at Cumberland University and at Harvard. In 1902 he married Alice Caldwell Hegan. He was a frequent contributor of poems to many magazines. His poems published in book form include "From Dusk to Dusk" (1898); "With Omar" (1900); "Song-Surf" (1900); "Nirvana Days" (1908); "Many Gods" (1910); "Far Quests" (1912); "At the World's Heart" (1914); "Earth and New Earth" (1916); "Trails Sunward" (1917); "Wraiths and Realities" (1918); "Songs to A. H. R." (1918); and "Shadowy Thresholds" (1919). He also wrote several poetic dramas, including "David" (1904); "A Night in Avignon" (1907), etc. A collection of his plays and poems was published in 1915. He was a member of the National Institute of Social Sciences, the Poetry Society of America, and the Society of American Dramatists and Composers.

RICE, JAMES, an English novelist; born in Northampton, England, Sept. 26, 1843. His reputation was well assured by the publication of "Ready-Money Mortiboy" (1872), the first of the series written in conjunction with Walter Besant. It was subsequently dramatized. This remarkable partnership continued with "The Golden Butterfly" (1876), "The Chaplain of the Fleet" (1881), "The Seamy Side" (1880), and several others. Previous to the partnership he had published "History of the British Turf" (1879). He died at Redhill, April 26, 1882.

RICE, W(ILLIAM) NORTH, an American geologist and educator, born at Marblehead, Mass., in 1845. He was educated at Wesleyan University and at the Sheffield Scientific School of Yale University. From 1867 to 1884 he was professor of geology and natural history at Wesleyan University, Middletown, Conn., and from 1884 to 1918, professor of geology, retiring in the latter year as professor emeritus. From 1907 to 1909 he served as acting president of this institution. From 1903 to 1916 he was superintendent of the Connecticut State Geological and Natural History Survey. He was a member and, at times, an officer of various scientific societies, and was also chairman of the Board of Examiners of the New York East Conference of the Methodist Episcopal Church, as well as president, and later secretary of the Council of the

Connecticut Federation of Churches. He edited the 5th edition of Dana's "Textbook of Geology" (1897), and published "Geology of Bermuda" (1884); "Science Teaching in the Schools" (1889); "Christian Faith in an Age of Science" (1903); "Through Darkness to Dawn" (1917), etc.

RICE INSTITUTE, an institution for higher education, founded in 1912, at Houston, Tex., from bequests left by William Marsh Rice, who, on his death, provided that his entire fortune of about $10,000,000 was to be used for this purpose. A campus of 300 acres was secured in 1909 at Houston, and the corner-stone of the first building was laid in 1911. This, with several other buildings, were ready for occupancy in 1912. Courses are offered in chemical, electrical, and mechanical engineering. There is also a course in architecture. The college is co-educational. In 1919 there were 678 students and 50 members of the faculty. President, E. O. Lovett, Ph.D.

RICH, EDMUND, an English ecclesiastic; born in Abingdon, England, about 1195. He studied theology at Paris, afterward taught the Aristotelian logic and scholastic philosophy in Oxford, and was prebendary and treasurer of Salisbury Cathedral 1219–1222. He preached the Sixth Crusade in 1227, became Archbishop of Canterbury in 1233, and exhibited great energy as a reformer. His authority was superseded by that of the legate, Cardinal Otho, and being unable to obtain redress at Rome, he retired to France in 1240 and died in 1242. He was canonized in 1249.

RICHARD I., King of England, surnamed Cœur de Lion; third son of King Henry II. and his wife, Eleanor of Aquitaine; born either at Oxford or at Woodstock, Sept. 8, 1157, but was brought up among the knights and troubadours of Poitou, in Aquitaine, with which duchy, his mother's patrimony, he was while still a child invested by his father. In England Richard did not spend in all his life a full year; after he became king he spent only 26 weeks in his kingdom. It may indeed reasonably be doubted whether he could speak English. A favorite of his unprincipled mother, he was induced by her to join his brothers Henry and Geoffrey in their rebellion (1173) against their father (see Henry II.). Henry II. had his eldest son, Prince Henry, crowned king as his successor during his own lifetime; and in 1183 he ordered that his younger brothers should do homage to him. Richard obeyed with the greatest reluctance; thereupon the ungrateful Prince Henry at once picked a quarrel with him, and marched an army into his duchy of Aquitaine. King Henry hastened to the assistance of the young duke, while the other brother, Geoffrey, sided with the prince. But the sudden sickness and death of the ingrate put an end to the quarrel. In the spring of 1189 Richard was in his turn in arms against his father. Philip of France, the pertinacious foeman of King Henry, mingled in the strife; and eventually Richard joined forces with his father's enemy, did homage to him, and took the field against the old king. A reconciliation was rendered more difficult because of Richard's jealousy of John, his father's favorite.

Richard became King of England, Duke of Normandy, and Count of Anjou on

RICHARD I.

July 5, 1189, and was crowned King of England on Sept. 3, following. But he had already taken the vows of the crusader; and besides his coronation, he had another object in coming to England; he wanted to raise funds for his crusade. He effected this latter purpose in a brief space of time by selling whatever he could get a purchaser for. About midsummer 1190 he met Philip of France at the rendezvous, Vezelai in France; but from Lyons he made his way by a different route from Philip to Messina in Sicily. Both kings spent the winter in that city, and their mutual jealousy came within a hair's-breadth of a rupture. The throne of Sicily had just been seized by the Norman Tancred, an illegitimate son of King Roger, though the lawful heir was Henry of Hohenstaufen, son of Frederick Barbarossa, and afterward the Emperor Henry VI. Moreover, Tancred detained in custody Johanna, widow of the late king (William the Good) and sister of Richard I., together with her very large dowry. But

he made his peace with Richard by giving up to him his sister and her possessions, and by betrothing his little daughter to the boy Arthur (son of Richard's dead brother Geoffrey), whom Richard now declared to be his heir.

On his way to Palestine in the spring of 1191, part of the fleet of the English king was driven on to the island of Cyprus, and the crews were most inhospitably treated by the reigning sovereign, Isaac Comnenus, a nephew of the Emperor of Byzantium, who had revolted from his liege lord. Richard sailed back from Rhodes, routed Isaac in battle, deposed him, and gave his crown to Guy of Lusignan. In Cyprus, too, he married Berengaria of Navarre, whom his mother had brought to him at Messina. At last, on June 8, the English king landed near Acre, and shortly afterward that stronghold surrendered, the siege having lasted two years. Richard took his full share of the jealousies, animosities, and disagreements, though not of the treacheries, that made the Christian crusading host a hotbed of commotion. The glorious exploits of Richard the Lion-hearted —his march to Joppa along the seashore, his approach on Jerusalem at Christmas, his capture of the fortresses in the S. of Palestine, his second advance in the summer of 1192 on Jerusalem (the city he never beheld), and his relief of Joppa —made his name ring throughout the East and excited the wonder and admiration of Christendom, but brought no real advantage to the crusading cause.

Richard, in September, concluded a peace with Saladin for three years, three months, and three days, and in his impulsive, impatient way started off home alone, without waiting for his army and fleet. A storm shipwrecked him near the N. end of the Adriatic. In disguise he began to make his way through the dominions of his bitter enemy, the Archduke of Austria. He was recognized, seized, and handed over to the Emperor Henry VI. (March, 1193). The emperor demanded a heavy ransom for his release, but promised to give him the kingdom of Arles in addition to his liberty. Richard's loyal subjects raised the money; and greatly to the chagrin of Philip of France and Richard's brother John, the captive king returned home (March 13, 1194).

In England in the meantime Longchamp had made himself so unpopular that Richard had been obliged to supersede him, appointing in his place Walter of Coutances, Archbishop of Rouen. It was John, however, who exercised the greatest power in the realm. And though he used his utmost endeavors to prevent Richard's return from his captivity, yet Richard generously forgave him. After distributing judicious rewards and punishments, raising what money he could, making arrangements for the governance of the kingdom, and being crowned again —the emperor is said to have forced his captive to resign his crown and take it back as a fief of the empire—Richard proceeded to France, and spent the rest of his life there, warring against Philip. England was governed in his absence by Hubert Walter, Archbishop of Canterbury, who by the measures he took to raise the vast sums demanded by his master trained the English people in habits of self-government. The most important constitutional advances made under Hubert's rule were the formulation of the methods for electing the county grand juries and an arrangement for keeping the pleas of the crown by officers who may be regarded as the forerunners of the modern coroner. Richard was shot, on April 7, 1199, by an archer of the Viscount of Limoges, while besieging that nobleman's castle of Chalus-Chabrol, and was buried in the abbey church of Fontevraud.

Richard cannot be called a good king; his only thought of his subjects was how to get money from them. He was not a faithful husband; he was an undutiful son. Yet, on the other hand, he treated his perfidious brother John in the most forgiving spirit, and was not incapable of noble and generous acts. His impulsive, hot-headed temperament made him at times cruel, but never vindictive. He was an adventurer, with a passionate love for contention and strife; he fought for warlike glory, not for victory or real advantage; he had all the personal courage and self-confidence of the born warrior. A fair scholar, he also had the knack of writing verses, and has been called a poet.

RICHARD II., King of England; son of the Black Prince and Joanna of Kent; born in Bordeaux, Jan. 6, 1367; was acknowledged by Parliament heir to the crown on the death of his father in 1376, and succeeded his grandfather, Edward III., on June 21, 1377. The government was entrusted to a council of 12, from which the king's uncles, John of Gaunt, Duke of Lancaster, Edmund, Earl of Cambridge, and Thomas, Earl of Buckingham (afterward Duke of Gloucester), were excluded. Nevertheless the central figure during the early years of this reign, as he had been during the last years of the preceding reign, was John of Gaunt, whose overreaching ambition and inability were a fruitful source of disquietude. He was on bad terms with the clergy and with the Londoners, and

was viewed with great suspicion by the king and the commons; yet he was the most powerful man in the kingdom, having at his back the nobles and to some extent the Lollards. War was going on with France, but in a very weak and desultory fashion; the French ravaged the S. coast at the time of Edward III.'s death, and truces were constantly being made for short durations. But this war cost money; so too did the extravagance of the court; and more was absorbed or wasted by the government, for which John of Gaunt was held by the nation at large to be mainly responsible. Consequently taxation was heavy.

The imposition of a graduated poll-tax in 1380 provoked popular risings, directed principally against the gentry and land-holders, in nearly all parts of the kingdom, at Whitsuntide in the following year. The insurgents destroyed the parks, attacked the manor houses, burned the court-rolls, and massacred the lawyers who had charge of them. The men of Essex and Kent, to the number of 100,000, marched on London. The former body, whom the king met at Mile End on June 14, consented to return home when the young monarch assured them he would grant their requests, and take measures to liberate the villeins from bondage and to commute their personal services into fixed money rents. The men of Kent, after destroying the Savoy (the Duke of Lancaster's palace), burning Temple Bar, opening the prisons, and breaking into the Tower and slaying the Archbishop of Canterbury, met the king at Smithfield (15th). During the negotiations, William Walworth, the mayor of London, struck down Wat Tyler, the leader of the insurgents. The king immediately rode among them, exclaiming he would be their leader, and granted them the concessions they asked, and the risings collapsed.

The causes of this wide-spread and simultaneous uprising on the part of the mass of the rural population may be summarized as follows: There had been long continuance of heavy taxation; the villeins resented the re-imposition since the black death of personal services, and were anxious to become tenants of their little farms at a fixed rental; the free tillers of the soil had formed themselves into associations to defeat the Statute of Laborers (1349), which fixed the maximum and minimum of wages; the Lollard or Wyclifite preachers were denouncing the idleness and vices of the regular clergy, and they and others (as John Ball) were promulgating social doctrines calculated to make the common people discontented with their lot and hostile to the landholders. From the fact that the insurgents directed their enmity against himself and the advisers of the king, John of Gaunt saw that he could never hope to succeed in his ambitious schemes in England; and from this time he kept very much in the background, till, in 1386, he carried himself and his restless plottings to Spain and Gascony. Richard, in 1390, made him Duke of Aquitaine for life. In 1385 Richard invaded Scotland, and took Edinburgh and burned it; but, not encountering the Scotch, returned home.

About the same year another coalition of the baronial party, headed by Thomas of Woodstock, Duke of Gloucester, began to oppose the king and his chosen friends. They impeached several of them before the Merciless Parliament (1388), and secured convictions and executions. But on May 3, 1389, Richard suddenly declared himself of age, and proceeded to govern on his own responsibility. For eight years he ruled as a moderate constitutional monarch, and the country enjoyed peace—hostilities with France were not renewed after 1388—and was fairly prosperous. But in 1394 Richard's first wife, Anne of Bohemia, whom he had wedded in 1382, died, and two years later he married Isabella, daughter of Charles VI. of France, a girl of eight. From that time he seems to have adopted very largely French tastes, manners, and ideas. At all events, in the Parliament of 1397 he began to assert the pretensions of an absolute monarch. On July 8 he had Gloucester, Arundel, and Warwick arrested on the charge of conspiring against the crown. Arundel was beheaded; Gloucester was sent a prisoner to Calais, and died there in prison, probably murdered, a fortnight after his arrest; and Warwick was banished to the Isle of Man. Thomas Arundel, Archbishop of Canterbury, was also banished. In the following year an obsequious Parliament granted to the king the subsidy on wool for life, and delegated all its authority and power to a commission of 18 members, all supporters of the king.

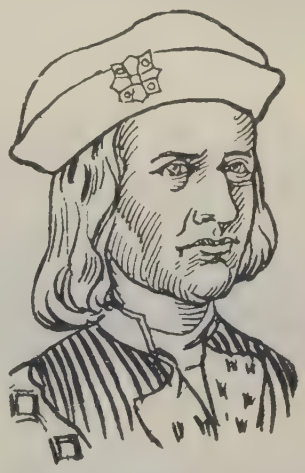
Richard soon aroused the slumbering discontent of his subjects by his unjust methods of raising money, principally by means of forced loans, and by his arbitrary and despotic rule. In the beginning of 1398 the Duke of Norfolk and the Duke of Hereford (Henry, son of John of Gaunt) were accused to the king of having spoken treason against him. Richard banished them—Norfolk for life and Hereford for 10 years. In January, 1399, John of Gaunt died, and Hereford succeeded him as Duke of Lancaster; but the king refused to give up to the exile the lands of his dead father. Richard in May went over to Ireland, which

he had previously visited at the head of a military expedition in 1394-1395. Henry of Lancaster seized on the opportunity afforded by the king's absence, and landed on July 4 (see HENRY IV.). Richard at once hurried back, but had neither heart nor power to withstand his cousin. He submitted to Lancaster at Flint, Aug. 19, was carried to London, and placed in the Tower. On Sept. 29 he resigned the crown, and on the following day was likewise deposed by the Parliament, which chose Henry of Lancaster as his successor.

A month after his resignation Richard was condemned to perpetual imprisonment by Parliament. His fate is wrapped in obscurity, beyond the almost certain fact that he met a violent death, for which it is not altogether clear that Henry IV. was responsible. A month after Henry's accession some noblemen of Richard's party formed a conspiracy to restore Richard to the throne, but their purpose was discovered. No doubt this decided the fate of Richard; at all events, authentic history knows nothing more about him from this time.

RICHARD III., King of England; son of Richard, Duke of York, a descendant of Edmund, Duke of York, fifth son of Edward III.; born in Fotheringay Castle, Oct. 2, 1452. After the defeat and death of his father in 1460 he was sent, along with his brother George, to Utrecht for safety, but returned to England after his eldest brother Edward won the crown (1461). Two years later he was created Duke of Gloucester, his brother George being made Duke of Clarence. In the final struggle between the York and Lancaster factions he took an active share; he led the van at the battle of Barnet, rendered valuable aid in winning the fight of Tewkesbury, and is believed, on fairly good evidence, to have had a hand in the murder of Prince Edward, son of Henry VI., who was slain after that battle. All through the reign of Edward IV. he gave valuable and faithful support to his brother, and was rewarded by him with every confidence, and with numerous high offices. He was believed to have been concerned in the murder of Henry VI. in the Tower on May 21, 1471; but the evidence, though strongly pointing in that direction, is not conclusive.

In the following year he married Anne, the younger daughter of Warwick the Kingmaker, who had been betrothed to the murdered Prince Edward. This alliance was greatly resented by Clarence, who had married the elder sister, and wished to keep all of Warwick's vast possessions in his own hands. Clarence quarreled, too, with King Edward, who in 1478 procured his impeachment by Parliament. The refractory duke was put to death privately in the Tower on Feb. 18. Of this judicial murder Gloucester is likewise accused; but the evidence for his complicity is very slight. In 1482 he was put in command of the army that invaded Scotland. Along with the Duke of Albany he entered Edinburgh; but his one warlike achievement was the capture of Berwick town and castle. In the following year, while still in Yorkshire, he heard of King Edward's death (April 9), and



RICHARD III.

learned that he himself had been named guardian and protector of his son and heir, Edward V., then aged 13. On his way S. the Protector arrested Earl Rivers and Lord Richard Grey, the uncle and step-brother of the young king, and confined them in his castles. All who were of the old nobility, and resented the rise of the Woodvilles, rallied round Richard. From this time Richard of Gloucester schemed for the crown, and by craft, boldness, and utter unscrupulousness carried his project into execution.

The arrest of Rivers and Grey had put the king entirely into his hands, for the queen-mother had hastened to take sanctuary at Westminster. On June 13 Gloucester suddenly accused Lord Hastings, an influential member of the council, of treason, arrested him there and then, and had him instantly beheaded. The "crime" for which Hastings died was changing sides from Richard to the Woodville party. On June 16 the queen-dowager was induced to give up, at the

demand of Richard and the council, her other son, the little Duke of York. He was put into the Tower to keep his brother, the king, company. On the Sunday following (22d) a certain Dr. Shaw preached at St. Paul's cross that the children of Edward IV. were illegitimate, nay, that Edward IV. himself and his brother Clarence were both born out of lawful wedlock. Three days later the Parliament desired Richard to assume the crown; on the next day (June 26, 1483) he declared himself king, and on July 6 was crowned in state by Cardinal Bourchier. Rivers and Grey were executed at Pontefract on June 25. In point of form Richard was a duly elected king, and Edward V. had not yet been crowned; all the same, his accession was *de facto* a usurpation. Richard's principal supporter all through, from the date of Edward IV.'s death, had been the Duke of Buckingham, a descendant of the Duke of Gloucester, who was privily slain at Calais when Richard II. was king.

Shortly after his coronation Richard set out on a tour through the kingdom, and during the course of it he was surprised by the intelligence that Buckingham was plotting with the friends of Henry Tudor, Earl of Richmond (afterward Henry VII.), the chief representative of the House of Lancaster, to effect his overthrow and proclaim Henry king. But the attempted rising soon collapsed, and Buckingham was taken and (Nov. 2, 1484) executed. It seems to have been shortly before this that Richard contrived the murder of his nephews in the Tower. The deed was done so secretly by Sir James Tyrrell, one of Richard's devoted followers, and a couple of hirelings, that the nation did not know of it till some time after (see EDWARD V.).

During the remainder of his short reign Richard directed all his energies to baffling the plans of Richmond, and to making preparations to meet the invasion which he saw to be imminent. But he was rapidly losing his hold on the nation, alarming and horrifying it by his crimes and tyrannous acts. Henry of Richmond at length landed at Milford Haven on Aug. 7, 1485. Richard met him at Bosworth in Leicestershire on the 22d, and there lost his kingdom and his life, fighting bravely like a king, crown on head, in the midst of his foes (see HENRY VII.). The body of the slain king was subjected to great indignities, carried to Leicester, and there, after being exposed for two days, was buried in the Grey Friars churchyard.

Richard's was a strangely mixed character. Its ruling passion was an inordinate craving for power, to gratify which he stopped at no crime, however heinous. He possessed many of the typical qualities of the best of the Plantagenets—a skilful soldier, of great ability and energy, brave, bold, reckless of consequences, fond of display, yet not incapable of nobler impulses.

He unquestionably had great charm of manner, and knew how to inspire confidence even in those who had the best reasons for distrusting him. He was liberal, too, and, where his own personal ambition was not directly concerned, just and generous. He was also swayed by a lively sense of divine justice, and more than one religious institution owed its foundation to his bitter remorse for the murder of his nephews. In person Richard was short of stature and slight of build, with one shoulder slightly higher than the other; but there is no evidence that he was a hunchback.

RICHARD OF CIRENCESTER, or **RICARDUS CORINENSIS**, a monkish chronicler of the 14th century, sometimes called the Monk of Westminster. He entered the Benedictine monastery of St. Peter's, Westminster, England, residing there during the remainder of his life; in 1391 he visited Rome. He was the author of a Latin history of England to the year 1348. The so-called Itinerary of Richard "On the Situation of Britain" (1758), formerly much referred to as an authority on Roman Britain, was a forgery perpetrated by Dr. C. J. Bertram, of Copenhagen. Richard died in his monastery about 1401.

RICHARD OF CORNWALL, Emperor of Germany; second son of John, King of England; born Jan. 5, 1209. In 1225–1226 he and his uncle, William of Salisbury, commanded an expedition which recovered Gascony, and the next year he received Cornwall as the result of a rising of the earls to compel the king, Henry III., to make provision for him. He managed his money matters well, and his wealth, as well as his prudence, saved Henry in many an impending crisis. For some years he acted with the English barons, to many of whom he was closely related by his marriage with Isabel, Countess of Gloucester, daughter of the Earl of Pembroke. In 1232 he was one of the leaders in the opposition to Hubert de Burgh; and in 1238 he headed an armed rising provoked by the king's secret marriage of his sister to Simon de Montfort. But Richard was still heir to the throne, and the articles which Henry was prepared to sign, and which dismissed his foreign advisers, appeared to the earl to bind the king's hands too closely, and he drew back. In 1240–1241 Richard was away on a cru-

sade, and the next year he was with his brother in Gascony; and in 1243 he married Sancha of Provence, sister of Queen Eleanor, and this second marriage drew him away from the baronage. In 1252 he refused the Pope's offer to sell him the crown of Sicily; but in 1257 he was elected by a majority titular king of the Romans, and was soon afterward crowned at Aix-la-Chapelle; and he was skilful enough to maintain a certain hold on Germany, lavishing his wealth to maintain his own position and the dignity of the empire. In the great struggle which took place between Henry III. and his nobles Richard at first acted as a peacemaker. Subsequently, however, he sided with his brother against Simon de Montfort; and he was taken prisoner at Lewes, and imprisoned for a year, till the battle of Evesham (1265) set him free. In 1267 he was a third time married, to Beatrice, niece of the Elector of Cologne. Richard died at Kirkham, April 2, 1272, broken-hearted at the loss of his eldest son, Henry, who was murdered at Viterbo by the Montforts, and immortalized by Dante. Two other sons died also without issue.

RICHARDS, BRINLEY, a British pianist and composer; born in Carmarthen, Wales, in 1819; began to study music at the Royal Academy in London about 1835; and on the completion of his studies soon won a good position in London as a pianist and teacher of music. He was for many years a professor of the Royal Academy. His compositions for sacred and part songs and for the pianoforte won great popularity, especially his "God Bless the Prince of Wales." Richards bestowed much attention on the study and encouragement of Welsh music. He died May 1, 1865.

RICHARDS, JOSEPH WILLIAM, an American metallurgist, born in Oldbury, England, in 1864. He was educated at the Central High School of Philadelphia, the Lehigh University, University of Heidelberg, and the Mining Academy of Freiberg. Beginning with 1887 he was successively instructor, assistant professor, acting professor, and professor of metallurgy at Lehigh University. From 1907 to 1910 he was also professor of electro-chemistry at the Franklin Institute of Philadelphia. He frequently acted as legal expert in chemical and metallurgical cases. During the World War he was a member of the United States Navy Consulting Board. He was a member, and at times an officer, of many domestic and foreign scientific societies. Among his publications are "Aluminium" (1887); "Metallurgical Calculations" (1906-7); "Non-ferrous Metals" (1908), etc.

RICHARDS, LAURA ELIZABETH, an American writer of juvenile books, daughter of Julia Ward Howe; born in Boston, Mass., in 1850. She published a great number of children's books, among them: "Five Mice" (1880); "Our Baby's Favorite" (1881); "Tell-Tale from Hill and Dale" (1886); and "Toto's Merry Winter" (1887); "Captain January" (1890); "Nautilus" (1895); "Love and Rocks" (1898); "Snow White" (1900); "Letters and Journals of Samuel Bridley Howe" (1906-1909); "Two Noble Lives" (1911); "Julia Ward Howe" (1915) (with her sister Maude Howe Elliott). "Daughter of Jehu" (1918); "Joan of Arc" (1919).

RICHARDS, THEODORE WILLIAM, an American chemist, born at Germantown, Pa., in 1868. He was educated at Haverford College, and the universities of Göttingen and Leipzig, and received many honorary degrees from many American and foreign universities. From 1894 to 1901 he was assistant professor and after that, professor of chemistry, at Harvard University. From 1903 to 1911 he was chairman of the chemical department of this institution and in 1912 became director of the Gibbs Memorial Laboratory. In 1907 he served as exchange professor from Harvard at the University of Berlin, in 1908 he was Lowell lecturer, and in 1902 became research associate of the Carnegie Institution. During the World War he was a member of the National Research Council and consulting chemist of the Bureau of Mines. With the help of his assistants he revised the atomic weights of many elements. His investigations covered important branches of physical and inorganic chemistry, on which subjects he has published many important papers. He was a member and at times an officer of numerous American and foreign scientific societies. Besides the Davy medal of the Royal Society (1910), the Faraday medal of the Chemical Society (1911), the Willard Gibbs medal of the American Chemical Society (1912), and the Franklin medal of the Franklin Institute of Philadelphia (1915), he was also awarded the Nobel prize in chemistry in 1915.

RICHARDS, WILLIAM TROST, an American landscape and marine painter; born in Philadelphia, Pa., Nov. 14, 1833. He was a student of Paul Weber and later studied in Europe, at Florence, Rome, and Paris. From 1878 till 1880, he had a studio in London, England. He was an honorary member of the National Academy. At the Metropolitan Museum,

in New York City, is a series of 47 water-color marines and landscapes, painted by him in 1871-1876. His "Wissahickon" was on exhibition at the Centennial Exposition in 1876. In the Corcoran Art Gallery, Washington, D. C., is hung his "On the Coast of New Jersey." Among his best-known paintings in oil are: "Midsummer" (1862); "Woods in June" (1864); "Land's End" (1880); "Old Ocean's Gray and Melancholy Waste" (1885). He died at Newport, R. I., Nov. 8, 1905.

RICHARDSON, ABBY SAGE, an American lecturer and writer on literary topics; wife of Albert Deane Richardson; born in Massachusetts, in 1837. She first essayed the stage. Her publications include: "Stories from Old English Poetry" (1871); "The History of Our Country to 1876" (1876); "Familiar Talks on English Literature" (1881); "Old Love Letters" (1883); "Abelard and Heloise"; and a number of adaptations for the stage, principally from the French. She died in Rome, Italy, Dec. 5, 1900.

RICHARDSON, BENJAMIN WARD, an English physician; born in Somerby, Leicestershire, England, in 1828; was graduated in medicine at St. Andrews University in 1854. In 1855 he edited the "Journal of Health"; and he gained the Astley Cooper prize by his treatise on "The Cause of the Coagulation of the Blood," and the Fothergillian gold medal by a disquisition on the "Diseases of the Fœtus," in 1856. He originated the use of ether spray for the local abolition of pain in surgical operations, and introduced methylene bichloride as a general anæsthetic. He was a fellow of the Royal College of Physicians and of the Royal Society, and president of the Medical Society of London. He published several works on medicine and hygiene, and was an earnest sanitary reformer. In 1893 he was knighted and died in 1896.

RICHARDSON, HENRY HOBSON, an American architect; born in New Orleans, La., in 1838; was graduated at Harvard in 1859; entered the École des Beaux Arts in Paris in 1860, where he speedily gained a reputation as a most promising pupil. In 1865 he returned to the United States, and entered on a remarkably successful professional career. He designed some of the most beautiful buildings in this country, notably Trinity Church, Boston; the building of the Boston and Albany railroad, at Springfield, the Albany city hall, the Buffalo Lunatic Asylum, the Cambridge Law Schools, and the new capitol in Albany. He died in Boston, Mass., April 28, 1886.

RICHARDSON, HOLDEN CHESTER, an American naval officer, born at Shamokin, Pa., in 1878. He graduated from the United States Naval Academy in 1901 and from the Massachusetts Institute of Technology in 1907. In 1904 he became assistant naval constructor, and in 1912, naval constructor. From 1915 to 1917 he was a member and secretary of the National Advisory Commission for Aeronautics. During the World War he rendered valuable services in connection with aeroplane construction and in May, 1919, served as the pilot of the NC-3 on the trans-Atlantic flight. He was a member of the Society of Naval Architects and Marine Engineers.

RICHARDSON, SIR JOHN, a British naturalist and Arctic traveler; born in Dumfries, Scotland, Nov. 5, 1787. After studying medicine at the University of Edinburgh he entered the royal navy, in 1807, as assistant-surgeon. He served on various stations till 1819, and was surgeon and naturalist to the Arctic expeditions of 1819-1822 and 1825-1827, under Sir John Franklin, exploring on the latter occasion the shores of the Arctic Ocean between the Mackenzie and Coppermine rivers. He wrote "Geognostical Observations" as an appendix to the "Narrative" published by Franklin (1829, London), and edited, along with Kirby and Swainson, the "Fauna Boreali-Americana" (4 vols. 1829-1837). In 1838 he was appointed physician to the fleet, and in 1846 was knighted. In March, 1848, he took charge of an expedition to search for Franklin, and on his return published "The Arctic Searching Expedition" (1851) and "The Polar Regions" (1861). He died near Grasmere, England, June 5, 1865.

RICHARDSON, SAMUEL, an English novelist; born in Derbyshire, in 1689. He was the son of a joiner. The man who was afterward the moralist of Salisbury Court was as a boy the "Gravity" and "Serious" of his school-fellows; the novelist who penned the interminable epistles of Clarissa and Harriet Byron was as a youth the favored and indefatigable amanuensis of half the girls in the neighborhood, acquiring in this artless office something of that strange knowledge of the minuter mechanism of the feminine mind which is so conspicuous a feature of his genius. He says of himself that he had only "Common school-learning"; but he appears to have been at Christ's Hospital. In 1706, at the age of 16, he was bound by his own wish to John Wilde of Stationers' Hall, a printer, with whom he served the usual period, ultimately completing the orthodox program of exemplary apprenticeship by

marrying his master's daughter. From 1713 to 1719 he worked as a journeyman printer. In the latter year he opened an establishment of his own in the center, and later in the N. W. corner (No. 11) of Salisbury Square, then Salisbury Court. His printing office and warehouses were in Blue Ball Court, on the E. side of the square.

He printed more than one newspaper, and by the favor of Speaker Onslow obtained the printing of the journals of the House of Commons, 26 volumes of which passed through his establishment. He was over 50 when two bookselling friends invited him to prepare a volume of familiar letters "in a common style, on such subjects as might be of use to those country readers who were unable to indite for themselves." Hence sprung "Pamela," published in November, 1740. It consisted of "a series of familiar letters from a beautiful young damsel to her parents. Published in order to cultivate the principles of virtue and religion in the mind of the youth of both sexes."

Its vogue, in a coarser and robuster age than ours, was extraordinary. Divines extolled her from their pulpits; fine ladies triumphantly exhibited her popular chronicles at places of amusement; and in remote country villages, when at last she was happily married, her rustic admirers set the bells a-ringing. In February followed a second edition; a third succeeded in March, and a fourth in May. Grub street fastening promptly on this unexampled popularity, hastily put together for sequel a "Pamela in High Life," which had the unfortunate effect of seducing Richardson into two supplementary volumes, now forgotten; and then Henry Fielding produced what Richardson and his coterie regarded as the "lewd and ungenerous engraftment" of "Joseph Andrews."

Eight years elapsed before Richardson published another novel—his masterpiece: "Clarissa; or the Adventures of a Young Lady," known generally as "Clarissa Harlowe." Virtue, in this performance, was not "rewarded," but ruined. The heroine is nevertheless drawn with a tenacity of insight to which "Pamela" could scarcely pretend; and the chief male character, that of Lovelace, though more of an abstraction, is scarcely inferior.

Having drawn the ideal woman in "Clarissa," Richardson proceeded, some five years later, to portray, in "Sir Charles Grandison," the perfect man—"the man of true honor." This is a work of much greater ability than "Pamela," but still far below "Clarissa." It has, moreover, no central story strong enough to reconcile the reader to the prolix impeccability of its superfine hero. Besides a solitary essay in Johnson's "Rambler" (No. 97), and the voluminous but not very interesting correspondence published (with an excellent memoir) by Mrs. Barbauld in 1804, Richardson left no other literary remains of any importance. In later life a nervous habit grew

SAMUEL RICHARDSON

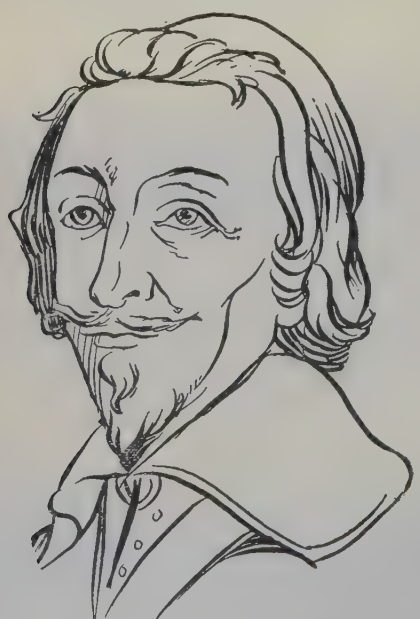
upon him, which terminated in 1761 by a fit of apoplexy, of which he died. He has left his own portrait in his letters to Lady Bradshaigh; but it might also have been deduced from his letters. He was a sentimental, purring, methodical, well-meaning little man, domesticated and affectionate, whose fitting environment was feminine society of the sympathetic sort; and he has repaid the gentle caresses with which his worshipers tempered the wind of adverse criticism to his sensitive soul by depicting their sex in return with a patience, a discrimination, a sustained analysis of secret spring and motive which it has been given to no other male author, living or dead, to achieve.

RICHARDSON, WILLIAM CUMMINGS, an American architect, born at Concord, N. H., in 1854. After studying architecture at the Massachusetts Institute of Technology from 1873 to 1875, he worked as an assistant in various architectural offices and made several trips abroad for further study. In 1881 he became a member of a firm of architects in Boston, which soon became one of the leading architectural firms in the United States. He designed many public and

private structures, most of them in New England, and including many of the most notable modern educational buildings of that section.

RICHEBOURG, JULES ÉMILE, a French dramatist; born in 1833, in Meuvy, Haute Marne. In 1850 he made his first appearance in Paris and after a short experience in a commercial house, obtained a place on the staff of "Figaro." He produced, in 1862, a five-act drama, "Nights in the Place Royale." In the following year he was yet more successful, with a comedy vaudeville called "A Modern Household." His first successful novel, "Lucienne," appeared in 1858, and from that time he turned out many melodramatic tales. He became literary and dramatic critic of "Le Petit Journal," a member of the Directory of the Société des Gens de Lettres, and a knight of the Legion of Honor. He died in Bougival, France, Jan. 26, 1898.

RICHELIEU, ARMAND JEAN DUPLESSIS, CARDINAL, DUC DE, a French statesman; born of a noble but impoverished family in Paris, Sept. 5, 1585.



CARDINAL RICHELIEU

Richelieu was educated for the army, but abandoned a military career for the Church, in order to keep in the family the bishopric of Luçon, to which he was consecrated at 22. Representative of the Poitou clergy at the States-general in 1614, he attracted the notice of the queen-mother, and rose in 1616 to be secretary at war and foreign affairs; but the downfall of Marshal d'Ancre, the queen-regent's favorite, in April, 1617, sent him back to his diocese. At length in August, 1620, the queen-mother and the young king were reconciled, mainly through the agency of the celebrated Capuchin Father Joseph—"l'éminence grise" of later days, till his death in 1638, the intimate friend of Richelieu. The latter showed much tact and patient forbearance in his measures; he formed an alliance with the powerful Duc de Luynes, and in 1622 was named cardinal, in 1624 Minister of State. This position he retained to the end of his life, in spite of countless court intrigues, and ere long the most powerful open and secret opposition from the queen, Gaston, Duke of Orleans, and a host of minor intriguers, first among whom was the too famous Duchesse de Chevreuse.

His first important measure was the blow to Spain of an alliance with England, cemented by the betrothal (1625) of the king's sister, Henrietta, with Charles, then Prince of Wales. In the Valtelline War he cleared the country of the Spanish and papal troops, but was unable to pursue his advantage, and had to submit to the terms of the peace of Monzon (1626). His next task was to destroy the political power of the Huguenot party. After a 15 months' siege, which he conducted in person, concentrating all his energy on the task, the great stronghold of La Rochelle was starved into submission, Oct. 30, 1628. He next turned to crush Rohan and the Languedoc rebels, and destroyed the proud walls of Montauban, last refuge of Huguenot independence. Early in 1630 he entered Italy with a splendid army, himself in command, and soon reduced Savoy to submission. Meanwhile he plunged into dark and tortuous intrigues with the Italian princes, the Pope, and with the Protestants in the N. against the House of Austria. He promised a large subsidy to Gustavus Adolphus, and, through the masterly diplomacy of Father Joseph at the Ratisbon Diet in June, 1630, succeeded in persuading Ferdinand to dismiss Wallenstein. The first treaty of Cherasco (April, 1631), ended the Italian war, the second gave France the important strategic position of Pinerolo.

Just before this final triumph Richelieu had successfully surmounted the greatest danger of his life—a great combination formed for his downfall by the queen-mother, Gaston of Orleans, the House of Guise, Bassompierre, Créqui, and the Marillacs. She tried to bully the king by her violence, but Richelieu followed his master to Versailles, and again had the whole power of the realm placed

entirely in his hands. So ended "the Day of Dupes" (Nov. 11, 1630). The queen-mother fled to Brussels, Bassompierre went to the Bastille, Gaston fled to Lorraine. The cardinal was now made duke and peer, and Governor of Brittany. Further intrigues and attempted rebellions by the emigrant nobles and governors of provinces were crushed with merciless severity—Marillac and Montmorency and other nobles were sent to the block. Meantime Gustavus Adolphus had run his brief and brilliant course; and his death at Lützen removed an ally with whom it might have become difficult to reckon. In July, 1632, Richelieu had seized the duchy of Lorraine. He continued his intrigues with the Protestants against Ferdinand, subsidizing them with his gold, but till 1635 he took no open part in the war. In May of that year, after completing his preparations and concluding a close alliance with Victor Amadeus of Savoy, Bernhard of Saxe-Weimar, and the Dutch, he declared war on Spain, and at once placed in the field an army of 132,000 men. But his first efforts were singularly unsuccessful, and in 1636 Piccolomini and the Cardinal-Infante, Governor of the Netherlands, entered Picardy, crossed the Somme, and threatened Paris itself.

In this hour of peril Richelieu rose to the height of his genius, and awoke a new and irresistible force as he threw himself on the patriotism of France. With 30,000 foot and 12,000 horse he swept the enemy out of Picardy, while his ally Bernhard drove them across the Rhine, and in 1638 destroyed the imperial army in the decisive battle of Rheinfelden, a victory which opened to him the gates of the key-fortress of Breisach. The unexpected death of Bernhard threw the fruit of his victories into the hands of Richelieu, whose policy soon bore further fruit in the disorganization of the power of Spain—revolts in Catalonia, and the loss of Portugal; the victories of Wolfenbüttel (1642) and Kempten (1642) over the Imperialists in Germany; and at length in 1641 in Savoy also in the ascendency of the French party. Another triumph that same year was the speedy collapse of the Imperialist invasion in the N. by the Count of Soissons, who perished in the first battle.

The hatred of the great French nobles to his rule had never slumbered, however, and Richelieu found safety alone in the king's sense of his own helplessness without him. The last conspiracy against him was that of the grand-equerry, the young Cinq-Mars, whose intrigues with Gaston, the Duke of Bouillon, and the Spanish court were soon revealed to the cardinal, the center of a network of espionage which covered the whole of France. When the hour was ripe he placed in the king's hands at Tarascon proofs of the traitorous plot with Spain, and was given full powers as lieutenant-general of the realm. Cinq-Mars and De Thou were at once arrested, and the wretched coward, Gaston of Orleans, hastened after his kind to buy his own security by betraying his accomplices. Cinq-Mars and De Thou were executed at Lyons in the autumn of 1642. But the great minister was himself dying in the hour of his greatest triumphs. He faced the inevitable at last with calm tranquillity—when the priest bade him forgive his enemies, he made answer, "I have never had any other enemies than the State's." He died Dec. 4, 1642, bequeathing Mazarin to the king as his successor.

Richelieu built up the power of the French crown, he achieved for France a preponderance in Europe, and throughout life he moved onward to his goal with the strongest tenacity of purpose, unmoved either by fear or pity. He destroyed the local liberties of France, and crushed every element of constitutional government, and his policy overwhelmed the citizens with taxation and made waste places some of her fairest provinces and most thriving towns. Our judgment of him will always differ according as we examine his end or his means—the public or the private man. He never sacrificed to personal ambition the interests of his country as these seemed to himself, but he often forgot in his methods the laws of morality and humanity.

The weakest point in Richelieu's character was his literary ambition and the extraordinary pains he took to construct a literary reputation. His own plays, for the fate of which he trembled with anxiety, sleep in safe oblivion, but his "Memoirs" are still read with interest. He founded the French Academy. His Correspondence and State Papers, edited by d'Avenel, fill eight volumes of the "Collection de Documents inédits sur l'Histoire de France" (1853-1877).

RICHELIEU, LOUIS FRANÇOIS ARMAND DU PLESSIS, DUC DE, a Marshal of France, descended from the same family as the Cardinal; born in 1696. After the death of Louis XIV., he was admitted into the court of the Regent; the Duc d'Orleans and he largely participated in its profligacy. He was sent to the Bastille in 1716, for fighting a duel with the Comte de Gacé, and again in 1719, as an accomplice with the Spanish ambassador in a conspiracy against the Regent. He distinguished himself under Villars, and afterward at Kehl, Philipsburg, Dettingen, and Fontenoy; conquered Minorca, forced the Duke of

Cumberland to submit to the capitulation of Klosterseven, and devastated the electorate of Hanover. In 1781, he obtained the rank of dean of the French marshals; and he concluded his long career, varied with acts of heroism and villainy, in 1788.

RICHEPIN, JEAN, a French poet and novelist; born in Médéah, Algiers, Feb. 4, 1849. He first attracted attention by his volume of poems "The Song of the Beggar" (1876), which sent him to prison where he wrote "Curious Deaths" (1887). A most audacious writer, he was faithful to his principles, or the lack of them. They include: "Caresses" (1877); "Blasphemies" (1884); and "The Sea" (1886), in verse; "Mme. André" (1878); "Brave Men" (1888); "The Cadet" (1890); "La route d'émeraude" (1909); the dramas "Monsieur Scapin" (1886); "The Filibuster" (1888); and "By the Sword" (1892). He was elected to the French Academy in 1908.

RICHMOND, a city of California, in Contra Costa co. It is on the Atchison, Topeka, and Santa Fé and the Southern Pacific railroads. Its situation on the west side of San Francisco Bay, with a frontage of 6 miles of deep water, make it an excellent shipping point. It is the center of the oil region of the Pacific coast, and is the terminus of the Standard Oil pipe lines. It contains large oil refineries. Its other industries include railway repair shops, pipe and steel works, porcelain factories, brick works, foundries, stone quarries, etc. The city has a park, a library, excellent school buildings, and a city hall. Pop. (1910) 6,802; (1920) 16,843.

RICHMOND, a city and county-seat of Wayne co., Ind.; on the Whitewater river, and on the Chesapeake and Ohio of Indiana, the Grand Rapids and Indiana, the Ohio Electric, and the Pittsburgh, Cincinnati, Chicago, and St. Louis railroads; 69 miles E. of Indianapolis. The Friends have the institutions, Earlham College and Friends' Academy. The city is also the place of the Yearly Meeting of the Orthodox Friends of Indiana. It has electric street railroads, gas and electric lights, waterworks, State Hospital for the Insane, Reid Memorial Hospital, a high school, National and private banks, and a number of daily, weekly, and monthly periodicals. Richmond has many industries, including flour and lumber mills, and manufactories of clothing, paper bags, paper, pianos, tile, automobiles, office furniture, desks, church furniture, boilers, traction engines, steam engines, carriages and wagons, bicycles, lawn mowers, plows, threshing machines, grain drills, etc. The city was founded by a colony of Friends in 1815. Pop. (1910) 22,324; (1920) 26,765.

RICHMOND, county-seat of Madison co., Ky.; 25 miles S. E. of Lexington. It is famous as the scene of one of the fiercest battles of the Civil War. The Confederate general, E. Kirby Smith, in command of 18,000 troops, attacked a much larger Union army under command of Gens. M. D. Manson and William Nelson, and after a three hours' battle utterly defeated the Union forces, whose loss, including killed, wounded and prisoners, was 5,000. The town contains the Central University and the Madison Female Institute. Pop. (1910) 5,340; (1920) 5,622.

RICHMOND, a city, port of entry, capital of the State of Virginia, and county-seat of Henrico co.; on the James river, and on the Southern, the Richmond, Fredericksburg, and Potomac, the Atlantic Coast Line, and the Chesapeake and Ohio and Seaboard Air Line, and other railroads; 116 miles S. W. of Washington, D. C. The city is about 127 miles from the ocean. The James river is navigable for large vessels and there is steamboat communication with Philadelphia, New York, Portsmouth, Norfolk and other Atlantic ports. The city is built on seven hills, and is surrounded by beautiful scenery.

Business Interests.—There are over 600 manufacturing establishments. In 1919 over $93,000,000 was invested in manufacturing establishments, which yielded sales of over $155,000,000. The chief industries are tobacco, iron, paper manufacturing, printing and publishing, and flour. The leading commercial institutions are the Chamber of Commerce, Corn and Flour Exchange, the Tobacco Exchange, and the Stock Exchange. It is the seat of a Federal Reserve Bank and other National banks. The total banking resources in 1919 were nearly $185,000,000. There are many daily, weekly, monthly, and other periodicals. The assessed property valuation exceeds $230,000,000, and the total bonded debt is about $14,250,000.

Public Interests.—The city covers an area of 26 square miles. The streets are lighted by gas and electricity. There is a public school enrollment of over 35,000. There are 42 public schools, and many private and parochial schools. In the city are a medical college, a theological seminary, a municipal mechanical training school, a women's college, Richmond College, and two colleges for colored students. The capitol, which stands on Shockoe Hill, and is surrounded by most of the other public buildings, is an im-

posing structure, dating from 1785. In the Central Hall, surmounted by a dome, are a statue of Washington and bust of Lafayette, Gen. Fitzhugh Lee, and others. The Senate Chamber, to the right, was used as the Confederate House of Representatives during the Civil War. The House of Delegates, to the left, contains portraits of Chatham and Jefferson, and was the scene of Aaron Burr's trial for high treason in 1807 and of the State Secession Convention in 1861. The executive mansion of the Confederate States, formerly the residence of Jefferson Davis, has been converted into a museum which contains many relics of the Civil War. The other notable public buildings include the City Hall, State Library, State Penitentiary, almshouse, custom house, etc. The prominent educational institutions are Richmond College (Bapt.), St. Joseph Female Academy (R. C.), the Medical College of Virginia, University College of Medicine, Women's College, and Mechanic's Institute.

History.—Richmond is said to have first been settled in 1609. Fort Charles was built as a defense against the Indians in 1644-1645. The city was incorporated in 1742, and became the capital of the State in 1779. In 1811 the burning of a theater destroyed the lives of 70 persons, including the governor of the State. In June, 1861, it was selected as the Confederate capital, and from that period was the objective point of a series of formidable military expeditions for its capture, under Generals McDowell, McClellan, Burnside, Hooker, Meade, and Grant, and defended by Gen. Robert E. Lee, with a large army and formidable lines of fortifications. Pop. (1910) 127,628; (1920) 171,667.

Battles around Richmond.—During the last three years of the Civil War (1862-1865) battles raged all round Richmond, and remains of the fortified lines constructed to protect the city are visible in various parts of the environs. Both the inner and outer fortifications may be seen from the Brook Road, which leads to the Lakeside Club House, with its golf links, bowling alleys and boating lake. The chief direct attack on Richmond was made on May 15, 1862, when the Union fleet attempted, without success, to force its way past the batteries at Drewry Bluff, on the James river, 7 miles below the city. Simultaneously General McClellan advanced with the land forces up the peninsula between the York and James rivers and invested Richmond on the E. and N. This led to the hardly contested but indecisive battle of Seven Pines or Fair Oaks (May 31, 1862), in which the Confederates under Gen. Joseph E. Johnson attacked McClellan's left wing, to the S. of the Chickahominy. Large cemeteries and a park now mark the spot, 7 miles to the E., reached by the West Point railroad. The district is swampy, and McClellan lost more men by pestilence than in fighting. Gen. Robert E. Lee now assumed command of the Confederate forces and made an attempt, in combination with Gen. "Stonewall" Jackson, to overwhelm McClellan's right wing, which was posted at Mechanicsville, on the Chickahominy, 5½ miles to the N. of Richmond, and thus began the famous Seven Days' Battle (June 28-July 2, 1862). Mechanicsville was followed by the battles of Gaines's Mill, Cold Harbor, Savage's Station, Frazier's Farm, and Malvern Hill. The upshot of this series of contests, in which 40,000 men fell, was the relief of Richmond, as the Union troops were compelled to retreat to Malvern Hill, 15 miles to the S. E., where they repelled the Confederates in their last attack but soon after withdrew to Harrison's Landing, on the James River. During 1863 there were no direct attacks on Richmond. In May, 1864, General Grant marched down through the "Wilderness" and attacked Lee in his entrenched position at Cold Harbor (June 3, 1864), and lost 15,000 men without making much impression on the enemy. He then transferred his army to the S. side of the James; and the later stages of the war were rather a siege of PETERSBURG (*q. v.*) than of Richmond.

RICHMOND, a city in Victoria, Australia, constituting a suburb of the city of Melbourne. It is situated in Bourke co., and is one of the pleasantest of the metropolitan suburbs, having numerous parks and public gardens. There are a number of prosperous industries in the city. Pop. about 40,000.

RICHMOND, CHARLES ALEXANDER, an American educator, born in New York City in 1862. He was educated at the College of the City of New York, Princeton University, and Princeton Theological Seminary, and received honorary degrees from a number of American universities. In 1888 he was ordained Presbyterian minister. After serving as pastor of churches in East Aurora, N. Y., and Albany, N. Y., he became, in 1909, president of Union College and chancellor of Union University, Schenectady, N. Y. In 1916 he was president of the New York State College Presidents' Association.

RICHMOND COLLEGE, a coeducational institution in Richmond, Va.; founded in 1832, under the auspices of the Baptist Church; reported at the close

of 1919: Professors and instructors, 20; students, 300; president, F. W. Boatwright, LL. D.

RICHMOND, GRACE S., an American author, born at Pawtucket, R. I. She was educated at the Syracuse, N. Y., High School, and by private tutors. Besides many short stories contributed to magazines, she wrote "The Indifference of Juliet" (1905); "The Second Violin" (1906); "With Juliet in England" (1907); "Around the Corner in Gay Street" (1908); "On Christmas Day in the Morning" (1908); "A Court of Inquiry" (1909); "Red Pepper Burns" (1910); "Strawberry Acres" (1911); "Mrs. Red Pepper" (1913); "The Twenty-Fourth of June" (1914); "Under the Country Sky" (1916); "Red Pepper's Patients" (1917); "The Brown Study" (1917); and "Red and Black" (1919).

RICHTER, JOHANN PAUL FRIEDRICH, known by his pen-name of JEAN PAUL, a German humorist; born in Wunsiedel, North Bavaria, March 21, 1763. He was brought up in the mountain villages in which his father was pastor,

JOHANN PAUL F. RICHTER

went to school at the town of Hof, and in 1781 was sent to Leipsic University to study theology. But Rousseau and Voltaire, Swift and Sterne, Pope and Young, had much stronger attractions for him, and he too resolved to write books. He asserted his independence of custom by discarding the periwig, wore his hair long and his shirt and vest open at the throat. Being poor, he got into debt all round, and in November, 1784, fled secretly from Leipsic to the poverty-stricken home of his mother at Hof. His first writings were satires; but he could get no publisher to introduce them to the world, till in 1783 Voss of Berlin gave him 40 louis d'or for "The Greenland Lawsuits." The book was a failure.

For three years Jean Paul struggled on at home, his mother spinning hard for bread. He read enormously and made excerpts from the books he devoured—a practice he kept up to old age. These many folios of closely-written pages were the storehouses on which he drew for materials when he came to write his romances. He took long rambles among the hills and forests. In the beginning of 1787 he began to teach the children of different families in the district. During his nine years of tutorship, he produced among other things, the satirical "Extracts from the Devil's Papers" (1789), "Fälbel's Journey" (1796), and "Freudel's Complaint" (1796), the last two among the best examples of his satirico-humorous writings; the beautiful idylls "Dominie Wuz" (1793), "Quintus Fixlein" (1796; Eng. trans. by Carlyle, 1827), the "Parson's Jubilee" (1797), the first two perhaps the most finished things Jean Paul ever wrote; the grand romances "The Invisible Lodge" (1793), "Hesperus" (1795; Eng. trans. 1865), and "Flower, Fruit, and Thorn Pieces," or "Siebenkäs" (1796-1797; Eng. trans. by Noel 1844 and 1871, by Ewing, 1877); "Companerthal" (1798; Eng. trans. 1857), a series of reflections on the immortality of the soul, and the prose lyrical idyll, "My Prospective Autobiography" (1799). "The Invisible Lodge" was his first literary success; "Hesperus" made him famous. In 1796 Charlotte von Kalb, perhaps the most remarkable woman of her age in Germany, wrote to express her admiration of the book; and at her invitation, Jean Paul visited Weimar. There Goethe received him politely, but with cool reserve; that, too, was Schiller's attitude, when Jean Paul went on to Jena to see him. The antagonism between them was deep and fundamental, and lasted till death. Herder and his wife, on the other hand, greeted the young romance-writer with overflowing admiration, and gave him their friendship, which also endured till death. As for Charlotte von Kalb; in spite of having a husband already, she exercised her sex's fabled privilege of leap-year and gave him unasked the love of her vehement heart.

From this time for a few years Jean Paul's life was rich in incident and full of excitement. He was the object of ex-

travagant idolatry on the part of the women of Germany, especially of those who dabbled in literature. He found all women charming, he was a delightful talker and a good listener, and had a sweet and sympathetic smile—qualities that explain a good deal. In 1801 he married a Berlin lady, and three years later settled down at Bayreuth. There he spent the rest of his days, leading a simple, busy life, writing his books, playing with his children, tending his pet animals, and taking short summer journeys to different towns of Germany. His last years were clouded by the death of his only son, a promising student, in 1821, and by his own blindness. From 1799 he enjoyed a pension from the Prince-primate Dalberg, and then from the King of Bavaria. He died Nov. 14, 1825.

The principal works of his married life were the two grand romances, "Titan" (1800-1803; Eng. trans. 1862) and "Wild Oats" (1804-1805; Eng. trans. as "Walt and Vult," 1849), the former accounted by himself and by most German critics his masterpiece, though Englishmen would generally prefer the latter, as they would certainly prefer "Siebenkäs" to "Hesperus"; "Schmeltzle's Journey to Flätz" (1809; Eng. trans. by Carlyle, 1827) and "Dr. Katzenberger's Trip to the Spa" (1809), the best two of his satirico-humorous writings; the idyll "Fibel's Life" (1811); the fragment of another grand romance, "Nicholas Markgraf, or The Comet" (1820-1822); a series of reflections on "Literature" ("Vorsschule der Æsthetik"; improved ed. 1812), containing many excellent things about poetry, humor, wit, style; another series on "Education" ("Levana," 1807; Eng. trans. 1848, 1876, and 1887), a book that ranks with Rousseau's "Emile" as a standard work on training the young, and is full of evergreen wisdom; various patriotic writings (1808-1812); and an unfinished "Autobiography" (1826), the finest of all his idylls.

Jean Paul stands apart entirely by himself in German literature, a humorist of the first water, a Titan. As a master of pathos he is put by De Quincey above Sterne.

RICHTHOFEN, FERDINAND BARON VON, a German geographer; born in Karlsruhe, Silesia, May 5, 1833; was educated at Breslau and Berlin universities, and at the Geological Institute of Vienna (1856); and in 1860 accompanied a Prussian expedition to eastern Asia. The next 12 years he spent in traveling through Java, Siam, Burma, California, Sierra Nevada, and China and Japan (1868-1872). He was appointed president of the Berlin Geographical Society (1873-1878), Professor of Geology at Bonn (1875), and of Geography at Leipsic (1883) and at Berlin (1886). His reputation as a geographer is built principally upon his great work on "China" (Berlin, 4 vols. 1877-1883), and upon "The Metallic Production of California" (1865), "The Natural System of Volcanic Rocks" (San Francisco, 1867), "Exercises and Methods of Modern Geography" (1883). He died Oct. 6, 1905.

RICIMER, a general of barbarian descent who ruled the W. Roman empire by emperors whom he set up and put down at will. He dethroned Avitus in 456, and appointed Majorianus emperor, whom he caused to be assassinated in 461. He then placed Libius Severus on the throne, and on his death in 465 he carried on the government for some time alone. In 467 Anthemius was put on the throne, and gave his daughter in marriage to Ricimer. The latter soon took up arms against his father-in-law, who was assassinated in 472. Ricimer died soon after.

RICKENBACKER, EDWARD VERNON ("EDDIE"), an American aviator, born in Columbus, Ohio, in 1890. Early

EDWARD VERNON RICKENBACKER

in his life he acquired a wide reputation as an automobile racer, winning many championships at national and international meetings. On the entrance of

America in the World War, he accompanied General Pershing to France as a member of the Motor Car Staff, and in August, 1917, was transferred at his own request to the Air Service. He became commanding officer of the 94th Aero Pursuit Squadron, the first American aero unit to participate actively on the western front. As a member of this unit he was credited with 26 victories. At the end of the war he retired with the rank of major, having received the Distinguished Service Cross with 9 palms, the Legion of Honor, and the Croix de Guerre. He wrote "Fighting the Flying Circus" (1919).

RICINUS, a genus of plants, order *Euphorbiaceæ*. *R. communis* is the palma christi, or castor-oil plant, a native of the East and West Indies and Florida. Castor oil is obtained from the seeds, either by expression with or without the aid of heat, or by decoction, or sometimes by the aid of alcohol. Castor seeds, when taken whole, are extremely acrid, and have produced death; but the expressed oil is a mild and most efficient non-irritating laxative. The palma christi has been cultivated in Algeria for the purpose of feeding silk worms on the leaves.

RICKETS, a disease peculiar to infancy, chiefly characterized by changes in the texture, chemical composition, and outward form of the bony skeleton, and by altered functions of the other organs. The chief external features are the legs bent outward, chest unduly projecting, head large and forehead projecting, spine often curved, joints large and prominent, general form stunted, etc. Rickets is chiefly a disease of large cities, and its development is favored by want of nourishing food, overcrowding, and neglect of sanitary and hygienic precautions generally.

RICKETTS, JAMES BREWERTON, an American military officer; born in New York City, June 21, 1817; was graduated at the United States military academy, in 1839; was a captain in the regular army in 1852; and gained a record for excellent service during the Mexican War. In 1861 he was appointed a Brigadier-General of volunteers, and commanded a division at the battle of Antietam, in September, 1862. He was in the thick of the battle of the Wilderness, May 5 and 6, 1864; was severely wounded at the battle of Cedar Creek, Oct. 19, 1864; and was brevetted Major-General, U. S. A., in 1865. He served in the Army of the Potomac from the first battle of Bull Run till Petersburg was besieged in 1864. He died in Washington, D. C., Sept. 22, 1887.

RIDDER, HERMAN, an American newspaper publisher and editor, born in New York City in 1851, of German parents. His boyhood was spent in various lines of industry, including life insurance, and in 1878 he established the "Katholisches Volksblatt." He founded the "Catholic News" in 1886. In 1890 he became trustee and manager, and in 1907 president of the New York "Staats-Zeitung," the largest and most influential daily paper, printed in the German language, in the United States. He came into conflict with the Federal authorities following the outbreak of the World War for an alleged pro-German campaign which he was charged with having carried on in his papers. In 1908 he was treasurer of the Democratic National Committee. He was an official of several important financial institutions. He died in 1915.

RIDDLES, or QUESTION PUZZLES. They were widely popular in dim antiquity, as today they are popular among many half-civilized races—not absolute savages, for to perceive an analogy demands some measure of culture. They may be broadly divided into two classes —riddles admitting of more or less easy solution, and riddles whose solution is beyond any wit of man, unless indeed, as is very often the case, the answer is known already. To the former class belong the enigma propounded by the Sphinx to Œdipus, and that which, according to Plutarch, Homer died of chagrin at not being able to answer. It seems to us easy now, for it was the one about the two boys who went hunting: all they caught they flung away, and all they could not catch they carried home. Propounding of riddles for wagers meets us frequently. Josephus relates how Solomon and Hiram, King of Tyre, once had a contest, in which Solomon first won a large sum of money from Hiram, but presently lost it all back to Hiram's subject Abdemon.

The riddle is found in the Koran, and several collections of riddles exist in Arabic and Persian. They were, it seems, also known to the ancient Egyptians, while among the Greeks they were allied in the earliest times with the oracular responses. But in Greece they first came into vogue about the time of the "Seven Sages," one of whom, Cleobulus, was celebrated for the composition of metrical *griphoi*. Apuleius wrote a "Book of Jokes and Riddles," but it is lost.

The riddle was much cultivated during the Middle Ages. Many French, English, and German riddle-books exist in MS., and some were printed at an early period. Wynkyn de Worde's "Joyous

Questions" (1511) contains several riddles that are simply coarse jests; but others, again, well illustrate the simple faith of mediæval Christendom—*e. g.*, "Demand: What bare the best burden that ever was borne? Response: The ass that carried our Lady when she fled with our Lord into Egypt." The Reformation checked, if it did not wholly stop, the merry pastime of riddle-making; but in France, in the 17th century, it began to creep back into favor, till at last riddles rivaled in popularity the madrigals and sonnets of the period. Le Père Menestrier, in 1694, wrote a grave treatise on the subject. The taste for riddle-making grew and grew, and many brilliant French writers, such as Boileau, Voltaire, Madame du Deffand, and Rousseau, did a little in this line. In Germany we have Schiller's delightful extravaganza "Turandot," and in England Cowper, Fox, Canning, and Praed are a few of the makers of poetical riddles or charades. Today with us the riddle is a mere *jeu d'esprit*, a conundrum or pun couched question-wise; but among the Irish, German, and Russian peasantry, the gipsies, the Zulus, the Samoans, and many more races, the old-fashioned sense-riddles, often enshrining a mythological germ, still hold their own.

RIDEAU, a waterway, partly natural and partly artificial, formed by lake, river and canal in the province of Ontario, Canada. The lake lies roughly 50 miles S. W. of Ottawa and the river Rideau flows out of it to become a tributary of the Ottawa river at the city of Ottawa. The canal, dating from 1834, connects Ottawa with Kingston on Lake Ontario, forming with the river and lake a waterway 126 miles long with 47 locks and a navigable depth of 4½ feet. The navigable portion with connections to the Cataraqui river and Mud Lake bore much commerce in the years following its linking up, but in later years the development of the railroad system took away from its navigation.

RIDEING, WILLIAM HENRY, an American author; born in Liverpool, England, Feb. 17, 1853. His books include: "Pacific Railways Illustrated" (1878); "A-Saddle in the Wild West" (1879); "Stray Moments with Thackeray" (1880); "Boys in the Mountains" (1882); "A Little Upstart" (1885); "The Boyhood of Living Authors" (1887); "In the Land of Lorna Doone"; "The Captured Cunarder"; "At Hawarden with Mr. Gladstone"; "How Tyson Came Home" (1905); "Boyhood of Famous Authors" (1908); "Many Celebrities and a Few Others" (1911). He died in 1919. In 1881 he became associate editor of the "Youths' Companion."

RIDEOUT, HENRY MILNER, an American author, born at Calais, Me., in 1877. He was educated at Harvard University where he served as an instructor of English from 1899 to 1904. Besides many short stories contributed to many magazines, he published "Letters of Thomas Gray" (1899); Tennyson's "The Princess" (edited with C. T. Copeland), (1899); "Freshman English and Theme—Correcting at Harvard College" (with C. T. Copeland) (1901); "Beached Keels" (1906); "The Siamese Cat" (1907); "Admiral's Light" (1907); "Dragon's Blood" (1909); "Selections from Wordsworth, Byron, etc." (with C. T. Copeland), (1909); "The Twisted Foot" (1910); "William Jones, a Memoir" (1912); "White Tiger" (1915); "The Far Cry" (1916); "The Key of the Fields" (1917); and "Tin Cowrie Dass" (1918).

RIDERS, additional provisions of a bill under the consideration of a legislative assembly, having little connection with the subject-matter of the bill. They are usually without enough specific merit in themselves to insure their adoption in any other way. Sometimes riders are attached to important bills, in order to gain the chance of passage, since by themselves they are likely to incur an executive veto, but as a part or proviso of an important bill they are absorbed in the main subject, and so dodge the "veto" and the "table." Appropriation bills are more than others "saddled with riders." The consequence of this custom is, practically, a limitation of the veto power of the executive. It has been proposed frequently that the Constitution of the United States be so amended that the President could veto single objectionable items, without affecting the main purpose of bills.

RIDGE, WILLIAM PETT, an English writer, born in Chatham, about 1860. He was educated in the private schools and began writing at an early age. His humorous stories of low-class life attained wide popularity. They include "A Breaker of the Laws" (1900); "Lost Property" (1902); "The Remington Sentence" (1913); "The Happy Recruit" (1914); "The Kennedy People" (1915); "Amazing Years" (1917); and "Top Speed" (1918).

RIDGEWAY, SIR WILLIAM, a British archæologist. He was born at Ballydermot, Ireland, in 1853, and was educated at Portarlington School and Trinity College, Dublin. He took up classical scholarship and archæology as his special line and has been professor of archæology at Cambridge since 1892. He is a member of Greek, French, Italian, Ger-

man and other societies and took a leading part in founding the Cambridge Departments of Anthropology and Architecture and in reforming classical tripos. His works include: "The Early Age of Greece"; "Origin and Influence of the Thoroughbred Horse"; "Homeric Lord System"; "Who Were the Romans?"; "The Oldest Irish Epic"; "First Shaping of the Cuchulain Saga"; "Origin of Tragedy."

RIDGEWOOD, a village of New Jersey, in Bergen co. It is on the Erie railroad, and is almost entirely a residential place. It has excellent schools and many handsome public and private buildings. Pop. (1910) 5,416; (1920) 7,580.

RIDGWAY, a borough of Pennsylvania, the county-seat of Elk co. It is on the Clarion river and on the Pennsylvania and the Buffalo, Rochester, and Pittsburgh railroads. Its notable buildings include a courthouse, a high school, a hospital and a Y. M. C. A. building. It is the center of an important lumbering region and has manufactures of leather, iron, clay, lumber products, silk goods, dynamos, machine tools, etc. In the neighborhood are valuable deposits of coal and natural gas. Pop. (1910) 5,408; (1920) 6,037.

RIDGWAY, ROBERT, an American ornithologist, born in Mt. Carmel, Ill., in 1850. He was educated in the public schools and at Indiana University. From 1867 to 1869 he served as zoölogist of the United States Geological Exploration of the 40th Parallel. In 1880 he became curator of the division of birds in the United States National Museum. He was a founder and twice the president of the American Ornithologists' Union, and was also a member of many American and foreign ornithological societies and conferences. He published, besides over 500 papers, the following books: "A History of North American Birds" (5 volumes, with Prof. Spencer F. Baird and Dr. Thomas M. Brewer); "A Manual of North American Birds"; "A Nomenclature of Colors for Naturalists and Compendium of Useful Information for Ornithologists"; "Color Standards and Color Nomenclature"; "The Ornithology of Illinois" (2 volumes); and "The Birds of North and Middle America" (8 volumes published).

RIDING, the art of sitting on horseback with firmness, ease, and gracefulness, and of guiding the horse and keeping him under perfect command. The art of riding may be divided into (1) ordinary riding, (2) school riding, (3) circus riding, and (4) side-saddle riding. The two objects aimed at in ordinary riding (which includes riding on the road, hunting, pig-sticking, stock-driving, breaking in young and freshly handled horses, playing polo, race and steeplechase riding) are to remain in the saddle and to make the animal carry its rider with the greatest possible ease to itself.

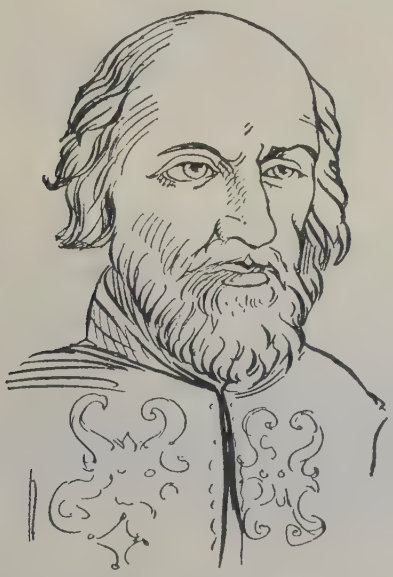
RIDLEY, NICHOLAS, an English clergyman, Bishop of London in the reigns of Edward VI. and his successor Mary; born about the commencement of the 16th century, and was educated at Cambridge. He afterward traveled on the Continent for three years, and on his return filled the office of proctor to Cambridge University. In 1547 he was chosen to the see of Rochester, and in 1550 superseded Bonner as Bishop of London. On the death of Edward he was involved in an attempt to secure the Protestant ascendency by placing the Lady Jane Grey on the throne. This, together with his connection with Cranmer, led to his being tried for heresy, and condemned to the stake. This sentence he underwent with the greatest fortitude, in company with his friend and fellow-sufferer Latimer, Oct. 16, 1555, in Oxford.

RIDPATH, JOHN CLARK, an American educator; born in Putnam co., Ind., April 26, 1840; was graduated at Indiana Asbury University in 1863; and later held a professorship in Baker University, Kansas. In 1869 he became Professor of English Literature at Asbury University, Indiana, and was elected its vice-president in 1879. Through his influence the endowment of nearly $2,000,000 was bestowed on the university by Mr. DePauw, whose name it now bears. In 1874-1875 he published a "History of the United States" which he supplemented with another in 1877. In 1876 he issued a "School History," and in 1879 an "English Grammar." Desiring to devote his whole time to literature, he resigned his university offices. In 1881, he published the "Life of Garfield," a "Life of J. G. Blaine" in 1848, a "Cyclopædia of History" in 1880-1884, a "History of Texas" in 1884, "Great Races of Mankind" in 1894, "Life and Times of Gladstone" (1898), and "A History of the United States" (8 vols. 1900). He died in New York City, Aug. 1, 1900.

RIEL, LOUIS, a Canadian insurgent, son of the half-breed leader of the Metis Indians who rebelled against Canadian rule; born in St. Boniface, Oct. 23, 1844. He was secretary of the Metis national organization, and later the president of their provisional government at Fort Garry in the Northwestern Territory. He

led the Metis' Red River rebellion in 1869, which was subdued by a Canadian force under General Wolseley. He fled from the territory to escape arrest, and returned after peace terms had been arranged. He was elected to the Dominion Parliament in 1873, but was not allowed to take his seat. Again he incited rebellion, but it assumed only small proportions and was subdued by the Canadian Government. His attempt to create resistance in 1885 was more successful, but the rebellion was overthrown by General Middleton's forces. Riel was captured, tried for treason, and was sentenced to death. It was generally believed by French Canadians that Riel was insane. He was executed, Nov. 16, 1885, at Regina in the Northwestern Territory.

RIENZI (re-ain'dza), **NICOLA GABRINI**, a Roman patriot; born about 1310. He was of obscure birth; but having received an excellent education, which he improved by a strong will and vigorous understanding, he was sent by his fellow citizens to Clement VI., at Avignon, in



NICOLA GABRINI RIENZI

order to prevail on that pontiff to return to Rome. His eloquence pleased the Pope, though it did not persuade him; and Rienzi on his return formed the design of making himself master of Rome, with the title of tribune. Having gained a considerable number of partisans, he entered the capitol, harangued the people, and elevated the standard of liberty. He designed to unite the whole of Italy into one great republic, with Rome for its capital. For some time he was successful, his government was popular, and even Petrarch wrote in his favor, comparing him to Brutus. But at length a conspiracy was formed against him; and having lost the popular favor by his arrogance and tyranny, he was compelled to seek safety in flight, but was taken and cruelly put to death in 1354.

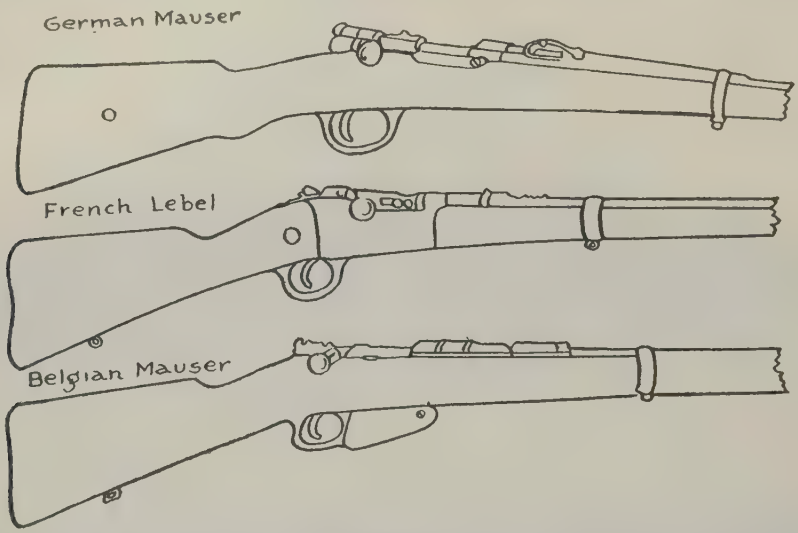
RIESA, Germany, a town situated on the Elbe, in Saxony, 33 miles northwest of Dresden by rail. It is an important railway junction. One of the finest steel and stone bridges in Germany spans the river at this point. The harbor accommodates a great volume of shipping, and considerable shipbuilding is carried on here. Iron foundries and machine shops add to the industries of the town. Pop. about 20,000.

RIESENGEBIRGE, or Giants' Mountains, a mountain range of Europe, separating Silesia from Bohemia and Moravia, till it joins the Carpathians; but the name is properly applied to that part of this range which lies between the sources of the Neisse and the Bober. It contains the loftiest mountains of the N. or central parts of Germany, the Schneekoppe being 5,257 feet high. The geological structure of the range consists of granite, gneiss and mica slate, and in the valleys there are coal and basaltic strata.

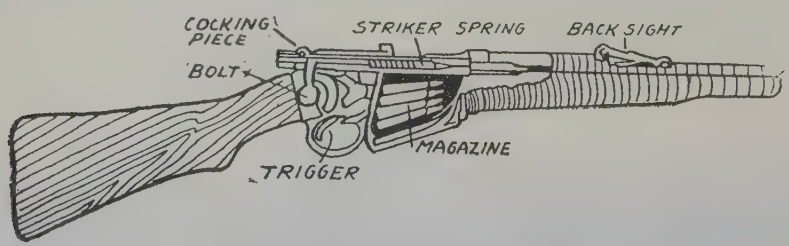
RIFF, a name given to the coast districts of northern Morocco extending from Ceuta to the W. frontier of Algiers, and forming a line of steep cliffs with few harbors. Its Berber inhabitants were formerly much addicted to savage piracy.

RIFLE, a gun of high power, long shooting range, and finding its classification among weapons, chiefly in respect to the construction of its barrel. The term rifle means a gun with a grooved barrel. Originally, this grooving was developed for the two-fold purpose of accommodating the excess carbonization from the discharge of the black powder cartridge and to impart greater definition to the bullet by contracting the internal area of the barrel. It was discovered, after long experimentation, that the most effective combination of these two qualities was attained by boring the barrel with a spiral grooving which induced the twisting or spinning motion in the discharging bullet, thereby greatly increasing its directional accuracy and diminishing or flattening the curve of its trajectory with corresponding increase in the effectiveness of the weapon for hunting, target and military practice. The progress of development in the perfection of the rifle both as a weapon for sport and an instrument of military accomplishment has

known three stages. The first stage might be said to have continued from the discovery of the principle of rifling up to the period of the successful production of the breech-loading rifle. In this stage, the muzzle-loading type of rifle reached its highest perfection and led to the advance from the ball form of cartridge to the sugar-loaf or elongated ball cartridge. In America this period extended to the time of the American Civil War. The Civil War and the impetus of western settlement and colonization pushed the rifle into high development and produced the Henry, Sharp, and Spencer rifles, all breech-loading weapons, and one, the Henry type, a lever-action gun, the ancestor of the modern repeating rifle. The problem of the breech-loading rifle was the development of a mechanism sufficiently strong and relatively small to withstand the terrific concussion of black-powder cartridges. The third stage in rifle development was reached when the solution of the breech-loading weakness was discovered and the area of modern rifle construction was issued in with the two great contributory aids of high tension steel and smokeless powder. The superior quality and dependability of steel which offered varieties to every mechanical requirement of the delicately adjusted machinery of the modern lever-action, bolt-action, and auto-action weapons, combined with the powerful advantages of smokeless powder which made possible the lightening of the barrel together with more accurate and careful rifling, led to the production of our modern hunting and military weapons. Two aspects of importance have appeared in this third and present state in the development of the rifle; the emphasis upon the mechanics of repeating shots which has resulted in several types of magazine rifles and culminated in the automatic weapons which have combined speed of action with high shell capacity; and the several spheres of shell development which have produced the high-power, long range

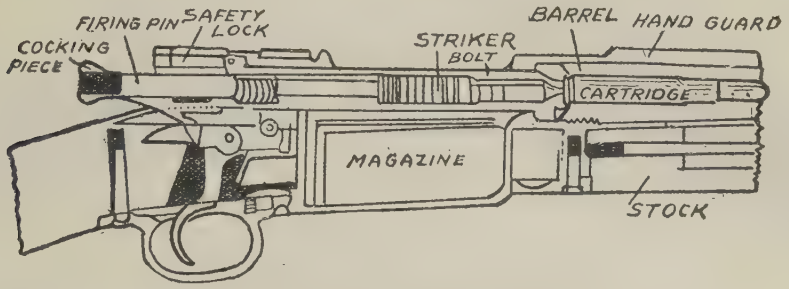


RIFLES



BRITISH LEE-ENFIELD RIFLE

hunting rifle of exceptional ballistic attainment and the similar military rifle possessing the same characteristics. Between these types of rifle and the rifle of shorter range or greater shocking power,



SPRINGFIELD MAGAZINE RIFLE

the variation in mechanism and rifling, with all the consequent alterations in weight, balance, form of stock and sight construction, have been made to depend upon the type of shell used and upon whether the weapon has been designed to employ the steel, soft-nosed or pure lead bullet in its shooting.

RIFLE-BIRD, the *Ptilorhis paradisæ*, often spoken of as one of the "Birds of Paradise"; is perhaps the best-known species of a genus which, according to Elliot, comprises four species confined to Australia and to New Guinea. *P. paradiseus* inhabits the S. E. districts of Australia, and is found only in very thick "bush." The male is regarded as more splendid in plumage than any other Australian bird. The upper parts are velvety black, tinged with purple; the under parts velvety black, diversified with olive-green. The crown of the head and the throat are covered with innumerable little specks of emerald green of most brilliant luster. The tail is black, the two central feathers rich metallic green. The female, as is often the case, is much duller colored than her mate.

RIGA, a city and capital of the republic of Latvia on the Dwina river (crossed here by a bridge of boats and a railway bridge), 7 miles from the mouth of the river, and 350 S. W. of Petrograd, via Pskoff. The old town has narrow streets and mediæval houses and stores; but the suburbs are laid out in broad streets with handsome buildings. The chief edifices are the cathedral, built in 1204, burned down in 1547, but rebuilt; St. Peter's Church (1406), with a steeple 460 feet high; the castle of the old Knights of the Sword, built 1494-1515, the former residence of the grand-master of the order; and several old guild houses and Hanseatic halls. It is the seat of an archbishop of the Greek Church. Prior to the World War its industries were rapidly growing; they turned out cottons, machines, tobacco, corks, spirits, oils, metal wares, glass, paper, flax, jute, and oilcloth, and employed nearly 12,000 people. Riga was founded in 1201 by Albert, Bishop of Livonia, and soon became a first-rate commercial town, and member of the Hanseatic League. It belonged to Poland from 1561, and in 1621 was taken by Gustavus Adolphus, and in 1710 was finally annexed to Russia. Riga suffered damage from attacks during the World War (1914-1918) and was captured by the Germans. See WORLD WAR. On the establishment of the Republic of Latvia (*q. v.*) in 1919, Riga became its capital. Pop. about 335,000.

RIGA, GULF OF, an inlet on the E. side of the Baltic Sea. It is 105 miles in length from N. to S. and about 60 in breadth. The islands of Oesel, Dagö, Mohn, and Worms, lie across the entrance. The chief river which falls into the gulf is the Dwina. Sandbanks render navigation in some parts dangerous.

RIGGING, ropes, chains, etc., used to support or operate a ship's masts or spars and set or trim the sails. Standing rigging (usually wire or hempen rope) is permanent and supports the masts and some of the spars. Running rigging (manila, hemp, cotton, flexible wire, or chain), generally run through blocks, is used in handling sails and spars. (See SAIL.) Tackle used in logging is also called rigging.

RIGGS, ELIAS, an American missionary and linguist, born Nov. 19, 1810, at New Providence, N. J. He published Armenian and Bulgarian translations of the Bible. He died Jan. 17, 1901.

RIGGS, KATE DOUGLAS WIGGIN. See WIGGIN, KATE DOUGLAS.

RIGHT OF WAY, the right which the public has to the free passage over roads or tracks. The expression is more generally applied to those public routes which are not statutory roads, such as hill or field paths, drove roads, bridle and other paths, and cart or driving roads in the common use of the public, which are not kept up by the county authorities. In many instances these roads are the only means of communication between important districts; and generally they are the shorter, and often the more picturesque, ways from one point to another. Right of way also exists along the seashore and on the banks of tidal rivers. The law of rights of way is judicial and not statutory. In Scotland, where of late the chief *causes célèbres* have originated, 40 years' continuous use by the public of such roads or paths is the prescriptive period for constituting a right of way; while in England the public acquire a right of way under dedication to them by the owner of the soil, and user signifying their acceptance of the same, or when dedication can fairly be assumed from notorious user, which needs generally to be proved for a lengthened period, but which may yet, according to circumstances, be presumed from a period of user of only a few years.

In Scotland there is no public authority for the protection of the interests of the public in rights of way, or for their maintenance. They are in the position of being left to chance; and "what is everybody's business is nobody's business" has resulted in many valuable rights being lost. The public, or individual members of the public, have to incur the costs and risks of litigation in the courts under an action of declarator to recover a road which a proprietor has closed, and it is difficult for them to do this. In England, though there is also no direct public authority for the guardianship of rights of way, yet their maintenance is so far provided for under section 10 of the Local Government (England) Act, 1888, which enacts that county councils "may, if they think fit, contribute toward the costs of the maintenance, repair, enlargement, and improvement of any highway or public footpath in the county, though the same is not a main road."

Both in Scotland and England influential societies exist for the purpose of assisting in the protection of public rights of way—viz., the Scottish Rights of Way and Recreation Society, Edinburgh, founded in 1844 and reconstituted in 1884, and the National Footpath Preservation Society, London, founded in 1884. There are also several societies for special districts. See ROADS.

RIGHTS, DECLARATION AND BILL OF. The Convention Parliament which called the Prince and Princess of Orange to the throne of England set forth, in a solemn instrument known by the name of the Declaration of Rights, the fundamental principles of the constitution which were to be imposed on William and Mary on their acceptance of the crown. This declaration (February, 1689), drawn up by a committee of the Commons, and assented to by the lords, began by declaring that King James II. had committed certain acts contrary to the laws of the realm, and, having abdicated, had left the throne vacant. The main provisions of the Declaration, and of the Bill of Rights (October, 1689), based on it, were to the effect that the power of suspending and of dispensing with laws by regal authority is illegal; that the commission for creating the late Court of Commissioners for Ecclesiastical Causes, and all commissions and courts of the like nature, are illegal; that the levying of money for the use of the crown by prerogative, without grant of Parliament, is illegal; that it is the right of the subjects to petition the king, and all prosecutions for such petitioning are illegal; that the raising or keeping of a standing army in time of peace, except with consent of Parliament, is illegal; that Protestant subjects may have arms for their defense; that the election of members of Parliament should be free; that freedom of speech in Parliament should not be questioned in any place out of Parliament; that excessive bail ought not to be required, or excessive fines imposed, or cruel or unusual punishments inflicted; that jurors should be duly impaneled, and that jurors in trials for high treason should be freeholders; that grants and promises of fines and forfeitures before conviction are illegal; and that for redress of all grievances, and the amendment, strengthening, and preserving of the laws, Parliaments ought to be held frequently. The remaining clauses treat of the succession to the crown.

RIGHTS OF MAN, DECLARATION OF THE, a famous statement of the constitution and principles of civil society and government adopted by the French National Assembly in August, 1789. In historical importance it may fairly be ranked with the English Bill of Rights and the American Declaration of Independence. It suggested the title for Paine's defense of the French Revolution against Burke (1791-1792); which was followed by Mary Wollstonecraft Godwin's "Vindication of the Rights of Women."

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RICE FIELDS IN THE INTERIOR OF CHINA

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JAPANESE LABORERS TRANSPLANTING RICE

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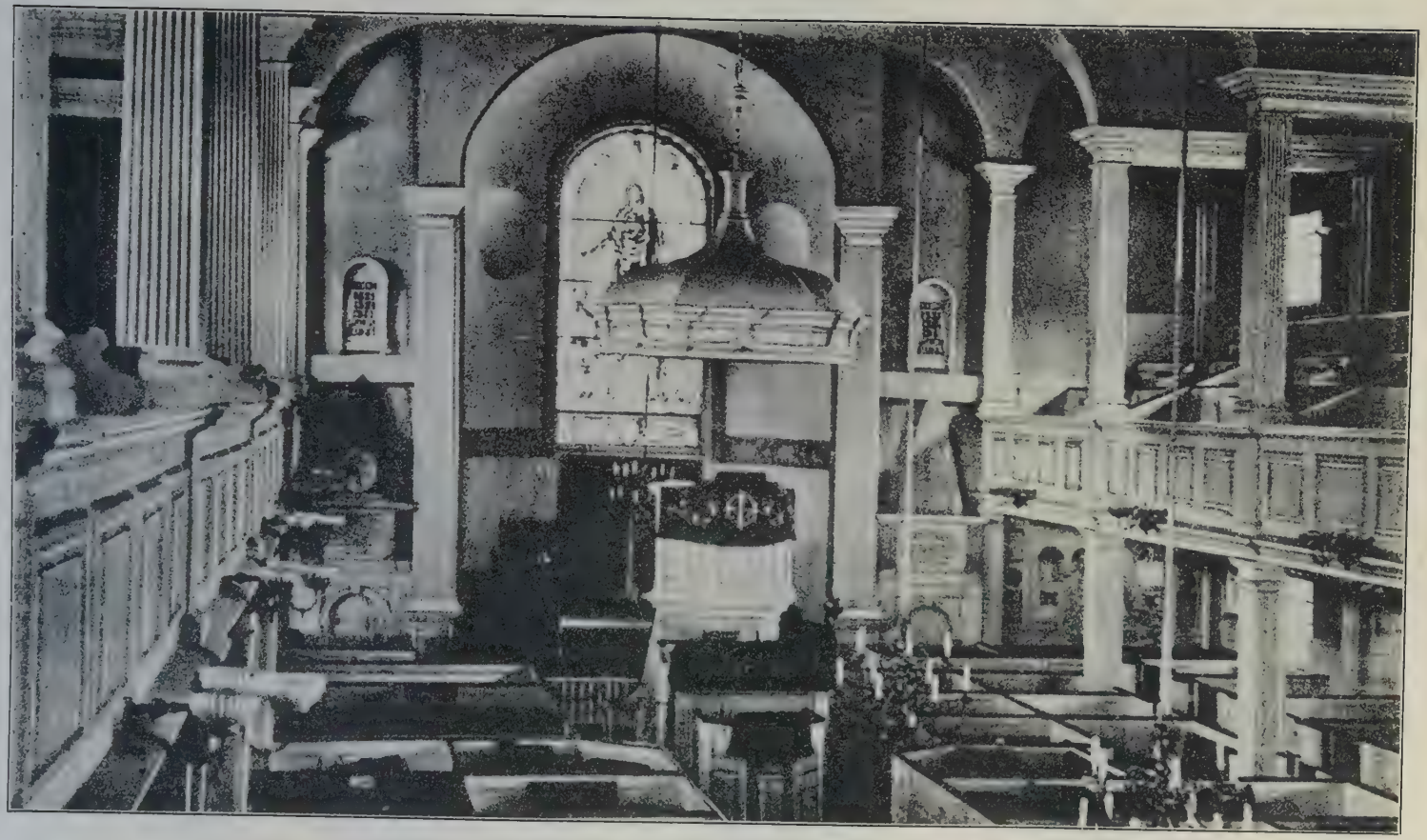
HARVESTING RICE ON A PLANTATION IN LOUISIANA

RICHMOND, CAPITAL OF VIRGINIA, SHOWING THE NEW SKY LINE AND A BRIDGE OVER THE JAMES RIVER



INTERIOR OF TRINITY CHURCH, NEWPORT, R. I.

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KARL STREET AND THE PROMENADE IN THE CITY OF RIGA

©Ewing Galloway

ROAD BUILDING WITH ASPHALT OVER A CONCRETE FOUNDATION IN DETROIT, MICH.

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RIVA, ON THE GARDA SEA, IN THE TYROL

RIGI, an isolated rocky mountain of Switzerland, in the canton of Schwyz, between Lakes Zug and Lucerne, 5,905 feet high. It affords one of the finest views in Switzerland, and is annually visited by numerous travelers. Two railways have been constructed to reach its summit (Rigi-Kulm) from opposite sides. They are on the "rack-and-pinion" principle, there being a central toothed rail into which works a toothed wheel under the locomotive. There is also a short line on the mountain worked on the ordinary principle. Hotels and similar establishments are numerous on the Rigi.

RIGOR MORTIS, the cadaveric rigidity or stiffness of the body which arises within seven hours after death. It begins with the muscles of the lower jaw and neck, then those of the trunk, next those of the arms, and, finally those of the legs. It ultimately passes off in the same order as it came. It is believed to be due to coagulation of fluid substance in the muscle.

RIG VEDA, in Sanskrit literature, the oldest and most original of the four Vedas, and probably the oldest literary composition in the world. In all likelihood it was in course of composition about 1,400 years B. C., but was not committed to writing at that time. It contains no allusion to writing or writing materials, and Max Müller believes that for a long period it was transmitted orally from generation to generation. It consists of 1,017 short lyrical poems, with 10,580 verses. The religion was nature worship, Indra, the Cloud-compeller, being the chief object of adoration, and, after him, Agni, the God of fire. The Hindu Triad had not yet arisen. The Rig Veda does not recognize the institution of caste. Beef was eaten. Women held a high position, and some of the hymns were composed by them. The rite of suttee was unknown; the conquest of India had only begun, and the Ganges, incidentally mentioned, had not become a sacred stream.

RIIS, JACOB AUGUST, an American author; born in Ribe, Denmark, May 3, 1849, came to the United States in 1870, and was for many years a reporter on the New York "Sun." He was identified with many charitable and social movements in conjunction with Theodore Roosevelt. He wrote "How the Other Half Lives"; "The Children of the Poor"; "Nibsy's Christmas"; "Out of Mulberry Street"; "A Ten Years' War"; "The Making of an American"; "Theodore Roosevelt" (1904); "The Old Town" (1909); "Hero Tales of the Far North" (1910); "Neighbors" (1914). He died in 1914.

RILEY, JAMES WHITCOMB, an American poet; born in Greenfield, Ind., in 1853. His contributions to newspapers and magazines first attracted public attention about 1875. They appeared under the pseudonym "B. F. Johnson of Boone." His writings soon became so popular that

JAMES WHITCOMB RILEY

he devoted himself to literature and public reading of his work with great success. His poems are characterized by both humor and pathos and by their sympathy with the simplest phases of life. Those of the Hoosier type are especially popular. He published, "Old Swimmin' Hole" (1887); "After Whiles" (1887); "Poems Here at Home" (1893); "Green Fields and Runnin' Brooks" (1893); "An Old Sweetheart of Mine"; "Rhymes of Childhood"; "Flying Islands of the Night"; "While the Heart Beats Young" (1906); "The Girl I Loved" (1910); "Old Times" (1915). He died in 1916.

RIMINI, a city of Italy, stands on the shore of the Adriatic, 69 miles by rail S. E. of Bologna; it is still surrounded with walls and contains many mediæval buildings. The cathedral, the temple altered and built to commemorate the unhallowed love of Sigismundo Malatesta and Isotta degli Atti, a beautiful Renaissance structure, dates from 1446-1450; the Church of St. Giuliano is adorned with pictures by Veronese, and St. Giro-

lamo with a picture of that saint by Guercino. The ancient castle of the Malatesta is now used as a prison. The little river on which the city stands is spanned by a white marble Roman bridge, 236 feet long, with five arches. Beside one of the gates stands the triumphal arch, 46 feet high, erected in honor of Augustus. The spot where Cæsar stood to address his soldiers after crossing the Rubicon (about 10 miles N. W. of Rimini) is marked in one of the squares by a monumental pillar. The city manufactures silks and sail cloth. Pop. about 50,000. One of its suburbs, half a mile distant on the seashore, is much visited for seabathing. Originally an Umbrian, and then for several centuries an Etruscan city, Rimini (Ariminum) fell into the hands of the Romans in 269 B. C. They made it the N. terminus of the Flaminian Way from Rome, and the S. terminus of the Æmilian Way to Piacenza and of the Popilian Way to Venice, and utilized the advantages of its position as a seaport for communicating with the E. side of the Adriatic. After being battled for by Goths and Byzantines, and held by the latter, the Lombards, and the Franks, it became a shuttlecock between the emperor and the Pope. At last, weary of this alternation of masters, neither of whom profited her, Rimini put herself under the protection of the House of Malatesta (1237), whose chiefs soon made themselves absolute masters of her fortunes. Among the tragic episodes that marked the family history of these rulers may be mentioned the killing of Francesca da Rimini and her lover by his brother, and the story of Parisina, the subject of Byron's poem. The most famous or rather infamous member of the family was Sigismundo (1417–1468), a brave and skilful soldier, a scholar, a patron of the fine arts, but a man of brutal animal passions and with no sense of right and wrong. The head of the house sold his rights over Rimini to the Venetians in 1503, but the Pope wrested them to himself in 1528 and kept them till 1860.

RIMSKY-KORSAKOFF, NICHOLAS ANDREIEVICH, a Russian composer; born at Tikhvin, Government of Novgorod, March 18, 1844. In 1856 he entered the Naval College in St. Petersburg, remaining until 1862, when he was sent on a three years' cruise. Thereafter resuming his musical studies, he became one of the foremost of Russian composers. Among the most important of his many operas are: "A Night in May" (1878); "The Snow Maiden" (1882); "Mlada" (1893); "Christmas Eve" (1895); "The Czar's Bride" (1898); "The Tale of Czar Saltana" (1900). His operas, which are based on national subjects, are little known outside of Russia. He died at St. Petersburg, June 20, 1908.

RIMU, a New Zealand tree (*Dacrydium cupressinum*) of the yew family. It grows to a height of 80 to 100 feet, and from two to six feet in diameter. Its wood is valued for general building purposes.

RINDERPEST. See CATTLE-PLAGUE.

RINEHART, MARY ROBERTS, an American author and playwright; born at Pittsburgh, Pa.; educated to be a trained nurse and married Dr. Stanley Rinehart in 1896. Her literary efforts were first noticed in 1908 when she came before the public with "The Circular Staircase." She was recognized at once as an author of great power and her success since then has been unabated. "Bab — a Sub-Deb," and "Dangerous Days" might be cited as representative of her more recent work, and in the dramatic field "Seven Days," produced at the Astor Theater in New York in 1909, and "The Bat" (1920) have exemplified her skill and charm, and her

MARY ROBERTS RINEHART

power to put the human interest element prominently into the difficult medium of the modern American play.

RINEHART, WILLIAM HENRY, an American sculptor; born in Carroll co., Md., Sept. 13, 1825; went to Baltimore in 1846; and found employment at his trade of stone cutter. He attended night school at the Maryland Institute and studied art; went to Italy in 1855 and studied under the best masters in sculpture; and while in that city executed two bas-reliefs, "Night" and "Morning," which attracted wide attention. He opened a studio on his return to Baltimore, but in 1858 established himself in Rome. His "Clytie," and "Love Reconciled with Death," in marble, at Baltimore, are noted for artistic feeling in prose. He completed Crawford's bronze doors for the National Capitol at Washington. He died in Rome, Oct. 28, 1874.

RING, any circle or section of a cylinder. Rings of gold, silver, and of other metals and materials have been worn in all times and countries, and while they have been used to decorate the ears, neck, nose, lips, arms, legs, and toes, finger rings have always occupied the most important and significant place among such ornaments. From the earliest period of civilized relationships the finger ring was a convenient means for carrying the signet of its wearer. Herodotus mentions the wearing of finger rings by the Babylonians; and from Asia the habit probably passed into Greece, though the Homeric poems mention earrings alone. In the later Greek legends the ancient heroes are described as wearing rings, and every freeman throughout Greece seems afterward to have possessed one. The Lacedæmonians wore iron rings. The Romans are said to have derived the use of rings from the Sabines; their rings were at first, as those of the Greeks, signet rings, but made of iron. Ambassadors, in the early age of the Roman republic, wore gold rings as a part of their official dress—a custom afterward extended to senators, chief magistrates, and in later times to the equites, who were said to enjoy the *jus annuli aurei*, from which other persons were excluded. It became customary for the emperors to confer the *jus annuli aurei* on whom they pleased and the privilege grew gradually more and more extensive till Justinian embraced within it all citizens of the empire whether *ingenui* or *libertini*. Rings entered into the groundwork of many Oriental superstitions, as in the legend of Solomon's ring, which, among its many magical virtues, enabled the monarch to triumph over all opponents and daily to transport himself to the celestial spheres, where he learned the secrets of the universe. The Greeks mention various rings endowed with magic power, as that of Gyges, which rendered him invisible when its stone was turned inward; and in old Saxon romances a similar ring legend is incorporated. The ring of POLYCRATES (*q. v.*), which was flung into the sea to propitiate Nemesis, was found by its owner inside a fish; and there were persons who made a lucrative traffic of selling charmed rings, worn for the most part by the lower classes. By many Mussulmans at the present day a ring having enclosed in it a verse from the Koran is worn as an amulet.

Various explanations have been given of the connection of the ring with marriage. It would appear that wedding rings were worn by the Jews prior to Christian times. It has been said that as the delivery of the signet ring to any one was a sign of deputing or sharing of authority, so the delivery of a ring by husband to wife indicated her admittance to share his rights and privileges. In pagan times in Europe the ring seems to have been connected with fidelity or with espousals. By an ancient Norse custom, described in the "Eyrbrygia Saga," when an oath was imposed, he by whom it was pledged passed his hand through a silver ring sacred to that ceremony; and in Iceland the ceremony of betrothal used to be accompanied by the bridegroom passing his four fingers and thumbs through a large ring, and in this manner receiving the hand of the bride, as is represented in a woodcut in an old edition of "Olaus Mangus." For betrothal, as well as for marriage, a ring is commonly bestowed; and in many countries both spouses wear wedding rings. Though the third finger of the left hand is the official finger, rings are worn on all fingers, and in mediæval times even the thumbs were frequently decorated with large and massive rings. During the 16th, 17th, and 18th centuries it was a very common practice to have mottoes inscribed on rings, including wedding rings, and the motto was called the posy or chanson. The ring was the symbol of the dominion of Venice over the Adriatic; and yearly, on Ascension Day, a ring was thrown by the Doge from the ship "Bucentaur" into the sea, to denote that as the wife is subject to her husband, so is the Adriatic sea to the republic of Venice. The reception of a ring forms an essential feature in the investiture of many Catholic dignitaries, and even in the Anglican communion. The "fisherman's ring," containing an engraved representation

of St. Peter in an ancient fishing boat, is the official ring of investiture of the Pope. It is broken and another made on the death of each Pontiff.

RING-DOVE, or **CUSHAT**, the largest of the pigeons inhabiting Great Britain, a bird which occurs very generally throughout the wooded parts of Europe. It is migratory in countries in which the severe winters preclude the possibility of its obtaining a due supply of food, and even in Great Britain, in which it permanently resides, it appears on the approach of winter to assemble in flocks, and to perform a limited migration, probably in search of food. A bluish-gray color prevails generally over the head, cheeks, neck, back, and rump, while the breast and under parts of the neck are of a purplish red, the belly and thighs dull white. A patch of white on either side of the neck forms a sort of ring or collar.

RINGED SNAKE, a harmless colubrine snake (*Tropidonotus* or *Coluber natrix*), with teeth so small as to be incapable of piercing the skin. It is common in England. It feeds on frogs, mice, young birds, etc., which it swallows alive. It is torpid during winter.

RING MONEY, a form of currency consisting of rings which seems to have originated with the Egyptians. It is still used in parts of Africa, and is manufactured in Birmingham for the use of African traders. A similar form of money was found by Cæsar among the Celts of Gaul, and appears also to have prevailed in Great Britain, as well as among the Scandinavian nations of northern Europe.

RING OUZEL (*Turdus torquatus*, or *Merula torquata*), a species of thrush, rather larger than a blackbird. It is a native chiefly of the W. parts of Europe; it spends the winter in the S. of Europe, northern Africa, Syria, and Persia, and visits more northern regions in summer. It occurs frequently in many parts of the British Islands, where it breeds even in the Orkneys. It is seldom seen in the more cultivated and thickly peopled districts, preferring mountain slopes, heaths, and their vicinity. The nest is made of coarse grass, within which is a thin shell of clay, and an inner lining of fine dry grass. The eggs are usually four; greenish blue in color, flecked and spotted with reddish brown; and not infrequently there is a second brood in July. The food consists of worms, slugs, insects, and moorland berries, and the bird often makes raids on fruit gardens, while in vine countries it feeds largely on grapes. In some parts of Scotland it is known as the moor blackbird. It is of a dark-brown, almost black, color; the feathers are edged with blackish gray, the wing feathers more conspicuously with gray, and there is a broad crescentic white gorget—whence the name. The legs and feet are brownish black. The female is lighter and browner, with a narrower and duller gorget. The song consists of a few loud, clear, and plaintive notes, but is somewhat monotonous. See OUZEL.

RINGWORM, an eruptive disease of the skin, more particularly on the head, and of which there are several kinds. The most common kind commences with clusters of small light yellow pustules, which soon break and form thin scabs, which, if neglected, become thick and hard by accumulation. When removed, they appear again in a few days; and by these repetitions the incrustations become thicker and the area of the patches extends, so as, if unchecked, to affect the whole head, and extend also to the forehead and neck. The patches are of an irregular circular form. This disease occurs generally in children of three or four years and upward. It is said to occur spontaneously in children ill-fed and uncleanly. The principal local treatment, when the patches are in an inflamed and irritable condition, consists in regular washing or sponging with warm water or some emollient fomentation.

RIO DE JANEIRO, the metropolitan province of Brazil, taking its name from the river Janeiro, which runs through it. It is bounded N. by the province of Espiritu Santo, E. and S. by the Atlantic ocean, and W. by the extensive region of Minas-Geraes; area, 26,634 square mlies; pop. (1917) 1,605,274. It is extremely fertile, producing sugar in great abundance, which is accordingly one of its chief exports. The other products are coffee, cotton, maize, rice, indigo, cacao, and fine woods. The country is mountainous, and is well wooded and watered.

RIO DE JANEIRO, or simply **RIO**, a city and seaport, capital of Brazil and of the province of the same name, and the largest and most important commercial city of South America; on the W. side of one of the finest bays in the world, 80 miles W. of Cape Frio. The city stands on a tongue of land close to the shore, on the W. side of the bay, at the foot of several high mountains which rise behind it. The houses are generally built of stone or brick. The streets are straight, well paved, and have excellent footpaths. The convents

and churches are numerous, but none of them can be called fine buildings. The cathedral is of a superior style of architecture. Parallel with the beach runs the main street, Primeiro de Marco, from which the minor streets branch off at right angles and are intersected by others at regular distances. The former imperial palace, now the National Museum, skirts the beach, and is seen to great advantage from the landing-place, which is within 60 yards of its entrance. The other public buildings are the naval and military arsenal, a public hospital, a national library containing about 300,000 volumes, colleges, and other educational and charitable establishments. It has, besides, several scientific institutions, a museum of natural history, a botanic garden, and a theater. The harbor is one of the finest known, and indeed can scarcely be excelled for capaciousness and the security which it affords to vessels of every description. The entrance into it from the sea does not exceed a mile from point to point; it afterward widens to about three or four miles, and is commanded in every direction with heavy batteries—all the numerous little islands with which it is interspersed being crowned with artillery. This city is the chief mart of Brazil, and especially of the provinces of Minas-Geraes, São Paulo, Goyaz, and Matto-Grosso. The manufacturing interests are comparatively unimportant. The imports in 1918 were valued at $119,419,000, the exports at $65,427,000. Pop. about 1,200,000. The first settlement at Rio, made by the French, dates back to 1555. The Portuguese founded the city proper in 1567, and it became the capital of Brazil in 1762. The court of Portugal was in residence at Rio from 1808 to 1821.

RIO DE ORO, a strip of coast with its hinterland belonging to Spain on the W. of the Sahara desert, Africa, stretching from Cape Blanco to Morocco and bounded on the E. and S. by the Territory of Mauritania belonging to France. Its area is about 121,400 square miles, the French boundary being settled and confirmed in 1900 and 1912. The region is an arid plateau, with a growth of esparto grass near the sea, and some oases inland. There is some cattle and camel raising and the inhabitants, chiefly negroes, number about 30,000.

RIO GRANDE, a river of western Africa, which enters the Atlantic by an estuary opposite the Bissagos Islands; upper course not well known.

RIO GRANDE DE CAGAYAN, the largest river in Luzon, Philippine Islands. It has its rise in the mountainous regions of the central part of the island, flows north two hundred miles and empties into the China Sea near the northern extremity of Luzon. The river is navigable for a distance of 13 miles from its mouth, to the town of Lallo, for river steamboats with a draught not exceeding 12 feet. The best quality of tobacco raised in the Philippines is produced along the banks of the river.

RIO GRANDE, RIO GRANDE DEL NORTE, or **RIO BRAVO DEL NORTE,** a large river of North America, rises in the San Juan mountains in southwestern Colorado, and flows generally S. E. into the Gulf of Mexico, forming on its way the entire boundary between Texas and Mexico. Its length is about 1,800 miles; it is for the most part a shallow stream, but small steamboats can ascend for nearly 500 miles. Its chief affluent is the Rio Pecos.

RIO GRANDE DO NORTE, a maritime state of northeastern Brazil. Area, 22,190 square miles. The surface is mountainous in the interior and poorly drained, the chief river being the Piranhas. The region is near the equator. Among the industries are fishing, salt production, vegetable wax preparation, horse and cattle raising, while rubber, sugar-cane, cotton, millet, and mandioca are cultivated. The capital is Natal. Pop. about 430,000.

RIO-GRANDE-DO-SUL, the extreme S. province of Brazil; bounded partly by the Atlantic, and bordering on Uruguay and the Argentine Republic; area, 91,336 square miles. Pop. about 900,000. It is well watered, contains much fertile land, and has a healthy climate. On the coast is the large lake or lagoon of Patos, besides others. The chief occupations of the inhabitants are cattle rearing and agriculture. Among the population are over 200,000 Germans, there being a number of flourishing German settlements. There are some 600 miles of railway. Hides, tallow, horse-hair, bones, etc., are exported. Capital, Porto Alegre.

RIOJA, FRANCISCO DE (rē-ō′Hä), a Spanish poet; born in Seville about 1585. He was a great scholar, librarian of the royal library and Chronicler of Castile. He was regarded as one of the best poets of his time. His best known work is "Epístola Moral á Fabio," full of sound advice regarding the superiority of a quiet and unassuming life. He wrote many sonnets under the titles of "To Riches," "To Poverty," "To the Spring," "To the Rose," and "Silvas." His "Poems," with extensive biography,

were published in 1867, and additions in 1872. He died in Madrid, Aug. 8, 1659.

RIO NEGRO ("black river"), the name of numerous streams, of which two are important: (1) A river of South America, and principal tributary of the Amazon. It rises in Colombia, and joins the Amazon after a course of about 1,000 miles at Manaos, Brazil. Through its affluent, the Cassiquiari, there is direct communication between the Amazon and Orinoco. (2) A river of South America forming the boundary between the Argentine Republic and Patagonia. It rises in the Andes in Chile, and is about 700 miles long. Its current is very rapid, and its bed obstructed with shoals and sand-banks.

RIOT, a disturbance of the public peace, attended with circumstances of tumults and commotion, as where an assembly destroys, or in any manner damages, seizes, or invades private or public property, or does any injury whatever by actual or threatened violence to the persons of individuals. By the common law a riot is an unlawful assembly of three or more persons which has actually begun to execute the common purpose for which it assembled by a breach of the peace, and to the terror of the public. A lawful assembly may become a riot if the persons assembled form and proceed to execute an unlawful purpose to the terror of the people, though they had not that purpose when they assembled. In England, every person convicted of riot is liable to be sentenced to hard labor. In Scotch law rioting is termed mobbing. A person may be guilty of mobbing who directs or excites a mob though he is not actually present in it. Mere presence without participation may constitute mobbing. By an act of George I., called the Riot Act, whenever 12 or more persons are unlawfully assembled to the disturbance of the peace, it is the duty of the justices of the peace, and the sheriff and under-sheriff of the county, or of the mayor or other head officers of a city or town corporate, to command them by proclamation to disperse. And all persons who continue unlawfully together for one hour after the proclamation was made, commit a felony and are liable to penal servitude or imprisonment.

Most, if not all, of the States of the American Union have riot acts somewhat similar to those of England, and the common law governs where no statutes have been enacted.

RIO TEODORO, or **RIO THEODORO**, also known as Rio Duvida, or River of Doubt, a river in Brazil, in the state of Matto Grosso, and rising in the Corde Leira dos Parecis. It is a tributary of the Rio Madeira, flowing northward between long. 59° and 61° W. and nearly a thousand miles in length. Theodore Roosevelt partly explored it in 1914 and its name was changed in his honor.

RIO TINTO, a river in southern Spain in the Province of Huelva, near whose sources are rich copper mines; the annual output (copper and sulphur) reaches 1,400,000 tons; these minerals are exported from the port of HUELVA (*q. v.*), 45 miles distant, near the mouth of the river. These mines were worked by the Romans—their Tharsis. During the years of Moorish supremacy they were unused, but they have been worked again since the middle of the 18th century. They were bought in 1872 by the Rio Tinto (London-Bremen) Syndicate for $20,000,000.

RIPLEY, GEORGE, an American author; born in Greenfield, Mass., Oct. 3, 1802; educated at Harvard University and Cambridge Divinity School; became a Unitarian minister in Boston; lived some years in Europe; was one of the founders of the Transcendental magazine, the "Dial" (on which he had Emerson and Margaret Fuller as coadjutors); and the originator and conductor of the communistic experiment at Brook Farm. He became literary editor of the New York "Tribune" in 1849, and was joint-editor with Charles A. Dana of the "American Cyclopædia" (1858–1863, 16 vols., also of the second edition). He died in New York City, July 4, 1880.

RIPLEY, WILLIAM ZEBINA, an American economist, born at Medford, Mass., in 1867. He was educated at the Massachusetts Institute of Technology and at Columbia University. From 1895 to 1901 he was a professor of economics at the Massachusetts Institute of Technology, and in 1901 he became professor of political economy at Harvard University. He lectured on sociology at Columbia University from 1893 to 1901; served as expert agent on transportation with the United States Industrial Commission, in 1900–1; and was the Huxley memorial lecturer at the Royal Anthropological Institute, London, England, in 1908. He was a member of numerous American and foreign scientific societies and twice vice-president of the American Economic Association. During the World War he served in the War Department as administrator of labor standards for army clothing, and in 1919 was chairman of the National Adjustment Commission of the United States Shipping Board. He published, besides many articles in peri-

odicals, the following books: "Financial History of Virginia" (1890); "The Races of Europe" (1900); "Trusts, Pools and Corporations" (1905); "Railway Problems" (1907); "Railroads: Rates and Regulation" (1912); "Railroads — Finance and Organization" (1914); "Special Report U. S. Eight-Hour Commission on Trainmen's Schedules and Agreements" (1917). He also edited "Selections and Documents in Economics," in 10 volumes.

RIPON, a city in the West Riding of Yorkshire, England, 22 miles N. W. of York. It is the seat of a bishopric, with notable cathedral and other ecclesiastical buildings. The market-place has a high obelisk and there is an Hiberno-Saxon crypt dating from the missionary period of the 7th century. The industries include iron founding, machine making and malting. The Irish missionaries in Northumbria established there one of the earliest monastic establishments in England, organized in 678 into a see. Pop. about 8,500.

RIPON, GEORGE FREDERICK SAMUEL ROBINSON, FIRST MARQUIS OF, a British statesman and administrator, born in 1827. He was the son of the first Earl of Ripon. He served in several diplomatic missions, but later became actively interested in the Christian Socialist movement. From 1853 to 1867 he was a Liberal member of the House of Commons for Huddersfield, and from 1857 to 1859, from West Yorkshire. In the latter year he entered the House of Lords, becoming Undersecretary for War. He was also successively Secretary for India, Secretary for War and Privy Councilor, and Secretary of State for India. He served as chairman of the joint high commission on the Alabama Claims in 1871. In 1873 he resigned his position in the cabinet and in the following year joined the Roman Catholic Church. For the six years following he was engaged chiefly in religious work. In 1880 he was appointed by Gladstone Governor-General of India. In his administration he introduced many reforms, chiefly relating to added political freedom of the governed peoples. He was First Lord of the Admiralty in 1886, Colonial Secretary in 1892, and Lord Privy Seal from 1905 to 1908. He died in 1909. He was made a Marquis in 1871.

RIPON COLLEGE, a co-educational institution for higher education, founded in 1851, at Ripon, Wis. It was originally called Brockway College and its present name was assumed in 1863. In 1919 there were 250 students and 21 instructors. President, H. C. Culbertson, LL.D.

RISTORI, ADELAIDE, an Italian actress; born in Cividale, Italy, Jan. 29, 1822. At a very early age she played in comedy, but afterward appeared in tragedy. She married the Marquis Capranica del Grillo in 1846, and afterward played in all the chief European capitals and in the United States. She took her farewell of the English stage in Manchester, Nov. 8, 1873. Among her chief characters were Medea, Francesca da Rimini, Marie Antoinette, Mary Stuart, and Lady Macbeth. In 1884 she visited the United States for the last time. She died Oct. 9, 1906.

RITA (MRS. W. DESMOND HUMPHREYS), a British novelist. She was born at Gollanfield, Scotland, educated at Sydney, N. S. W., and was twice married. She went to Australia as a child with her parents, later returned to Britain and has traveled much. She commenced to write at a very early age, her works including: "Dame Durden," "Darby and Joan," "Corinna," "My Lord Conceit," "Asenath of the Ford," "Two Bad Blue Eyes," "Gretchen," "A Husband of No Importance," "A Gender in Satin," "Sheba," "Joan and Mrs. Carr," "The Ending of My Day," "Faustine," "A Woman in It," "Vignettes," "Peg the Rake," "Kitty the Rag," "Good Mrs. Hypocrite," "The Sinner," "An Old Rogue's Tragedy," "A Woman of Samaria," "Vanity," "The Sin of Jasper Standish," "Prince Charming," "A Jilt's Journal," "Souls," "The Rubbish Heap," "The Philanthropic Burglar."

RITCHIE, ANNE ISABELLA (THACKERAY), LADY, an English author, daughter of William Makepeace Thackeray; born in London in 1838. Among her writings are: "Old Kensington" (1873); "Toilers and Spinsters" (1873); "Bluebeard's Keys" (1874); "Miss Angel" (1875); "Mme. de Sévigné" (1881); "Records of Tennyson, Ruskin, and Browning" (1892); "Lord Tennyson and His Friends" (1893); (with R. Evans) "Lord Amherst and the British Advance Eastward to Burma" (1894); "Chapters on Unwritten Memoirs" (1895); "Blackstick Papers" (1908); "From the Porch" (1912). She died in 1912.

RITSCHL, ALBRECHT, a German theologian; born in Berlin, Germany, March 25, 1822. His university studies were carried on at Bonn, Halle, Heidelberg, and Tübingen. In 1846 he "habilitated" at Bonn, the subject of his thesis being the relation between the gospel of Marcion and the canonical gospel of

Luke. Ritschl, who had become Professor extraordinarius of Theology at Bonn in 1853, was promoted to an ordinary professorship in 1859, and in 1864 was transferred to Göttingen, where the rest of his life was spent. His lectures, especially those on Christian ethics, soon became famous for their originality and vigor. Ritschl is usually classified as an "eclectic mediating theologian"; perhaps "intermediate" would be a better word, for his theology is uncompromisingly opposed alike by the "rationalists" and by the "orthodox" parties. The Ritschlians now form a large and important school in Germany, the most prominent among them being Kaftan, Herrmann, and Bender. His principal work, on the Christian doctrine of justification and reconciliation, was published in three volumes (1870–1874); the first of which traces the history of the doctrine, the second discusses its Biblical premises, and the third its theological meaning. An English translation of the first volume appeared in 1871. The distinguishing feature of the Ritschlian theology is perhaps the prominence it gives to the practical, ethical, social side of Christianity. Among his works are "A Treatise on Christian Perfection," "A Tract on Conscience," "A Tract on Theology and Metaphysics," etc. He died in Göttingen, March 20, 1889.

RITTENHOUSE, DAVID, an American astronomer; born near Philadelphia, Pa., April 8, 1732. Originally a clock and mathematical instrument maker, he became master of the United States mint, and succeeded Franklin as president of the American Philosophical Society. He was the first to use spider lines in the focus of a transit instrument. He died in Philadelphia, Pa., June 26, 1796.

RITTER, KARL, a German geographer; born in Quedlinburg, Prussia, August 7, 1779; studied at Halle, became a private tutor in 1798, and in 1819 succeeded Schlosser as Professor of History at the Frankfort Gymnasium. He then published an "Introduction to the History of European Nations Before Herodotus," 1820; and in the same year became Professor extraordinary of Geography at the University of Berlin, where he remained till his death. His great work is "Geography in Its Relations to Nature and History," the two first volumes of which appeared in 1817–1818, but it ultimately comprised upward of 20 volumes. He wrote several other geographical works, and contributed extensively to the journals of the Berlin Geographical Society. He died in Berlin, Sept. 28, 1859.

RITUAL, the name of one of the service books of the Roman Church, in which are contained the prayers and order of ceremonial employed in the administration of certain of the sacraments (communion out of Mass, baptism, penance, marriage, extreme unction) and other priestly offices of the Church, forms of churchings, burials, and blessing. In its present form it dates from the Council of Trent, which directed a revision of all the different rituals then in existence (also known as *manuale, sacerdotale,* etc.), which were numerous, and exhibited considerable variety of detail. Paul V., in 1614, published an authoritative edition, which has frequently been reprinted, and of which a further revision was issued by Benedict XIV. Besides the Roman ritual there are many diocesan rituals, some of which are of much historical interest. In the Greek Church, as in the other Eastern communions, the ritual forms part of the general collection (which contains also the Eucharistic service) entitled "Euchologion." In the Anglican Church the "Book of Common Prayer" may be said to contain the ritual. The most approved commentary on the Roman ritual is that of Barrufaldo.

RITUALISM, a strict adherence to rites and ceremonies in public worship. The term is more especially applied to a tendency recently manifested in the Church of England, resulting in a series of changes introduced by various clergymen of the High Church party into the services of the Church. These changes may be described externally as generally in the direction of a more ornate worship, and as to their spirit or animating principle, as the infusion into outward forms of a larger measure of the symbolic element. They are defended on the grounds of law, ancient custom, inherent propriety, and divine sanction or authority. The Ritualists hold, with most others, that all authoritative and obligatory regulation on ritual is not laid down in the New Testament, but they, or many of them, maintain that a knowledge of what is obligatory in ritual is derived from apostolical tradition, going back to apostolical times. They argue that the design of the institution of Christianity was not to abrogate the external ceremonials by which the patriarchal and Mosaic dispensations in the Old Testament were distinguished; but to replace them by a higher ceremonial, and they explain the comparative simplicity of primitive worship by the secrecy and restraint to which the early Church was subjected. The points of ritual about which there has been the most violent

contention are those which involve the adoration of Christ as present on the altar under the forms of bread and wine. Other points are: The E. position of the priest at consecration; lights on the holy table; the use of various vestments; the use of incense; mixing water with wine for communion; fasting before communion from previous midnight; regular confession to a priest, with absolution and penance, etc. The legal position of the Ritualists is that the first Book of Common Prayer, issued in the second year of Edward VI. (1549, with alterations made in 1552, 1604, and 1662), is still the guide of the Church in all matters pertaining to ritual, the present prayer-book not being in itself complete, but referring to this first prayer-book in its opening rubric. Various judgments have been given in ecclesiastical courts against extreme Ritualists, and some of their proceedings have been pronounced illegal. Ritualistic practices have been generally condemned by the bishops, and an act of Parliament giving them power to restrain innovations of this kind came into force on Aug. 7, 1874. The ritualistic movement in the Church of England arose out of the High Church movement inaugurated by the Tractarians.

RIVAS, capital of the department of Rivas, Nicaragua, 49 miles S. E. of Managua. The town is picturesque and is a development of the older Indian town of Nicarao, which was of importance as a stronghold and center of traffic. The surrounding region is agricultural, the chief produce being cacao, the production of which gives employment to many. Pop. about 15,000.

RIVER. Water falling on the land in the form of rain, or resulting from melting snow, or rising to the surface in springs, flows over the surface to a lower level. Where two slopes of land dip together the surface drainage collects to form a stream, and when evaporation is not very rapid several such streams ultimately unite and the volume of water they carry flows to the sea or to a salt lake. Small streams are termed runnels, rivulets, rills, brooks, becks, or burns; large streams are termed rivers, but the word has no precise reference to the magnitude of the stream to which it is applied.

The beginning of a stream—whether brook or river—is called its source, and may be a spring issuing from underground, a lake or marsh in which rainfall accumulates, melting snow, or simply the gathering tricklings from falling rain. The path of a stream is its course, and is the line of lowest level from the source to the end, which if occurring in a lake or the sea is termed its mouth. The connected streams which unite in one river form a river system. The series of convergent slopes down which a river system flows—the land which it drains—forming its basin or catchment area, and the name watershed is also sometimes erroneously applied to it. The names watershed, waterparting, and divide are used to designate the boundary line separating adjacent basins. A watershed is always the meeting-place of the highest part of divergent slopes, and from the characteristic form of continents the main watershed of a continent is almost always the crest of a range of mountains. In many cases, however, the diverging slopes meet in a low plain the summit of which may be occupied by a great marsh whence rivers creep away in opposite directions. The basins of all the rivers draining into the same ocean are called collectively the drainage area of that ocean. The main river to which the others are said to be tributary gives its name to the whole river system. It is often difficult to decide which of several converging streams is entitled to carry the name of the main river to its source. Some geographers give this distinction to the longest, others to that with the highest source, and others to that with the most direct course. The course of a typical river has been divided into three parts, though these are not represented in all cases. The torrential or mountain track is the steepest, its gradient usually exceeding 50 feet in a mile, and the velocity of its current being very great. The valley or middle track has a gradient which is rarely greater than 10 feet and often less than 2 feet in a mile. The plain track nearest the mouth of a river has a gradient of only a few inches in a mile. Rivers such as the Amazon, Mississippi, Ganges, Volga, and the long rivers of Siberia, in which the plain track is of very great length, are the most valuable for navigation, the limit of easy navigability being a gradient of about 1 foot in a mile.

The velocity of a river is proportional to the slope of the bed, but it also bears a relation to the depth of the channel and the volume of water flowing in it. On account of friction on the bottom and sides of the channel retarding the stream, the water flows fastest on the surface and in the middle. The carrying power of a river for suspended solid particles and for stones and gravel pushed along the bed depends on the velocity alone. The following table shows how rapidly the carrying power falls off as the velocity diminishes.

0.170	mile	per	hour	will just begin to work on fine clay.
0.340	"	"	"	lift fine sand.
0.454	"	"	"	lift sand as coarse as linseed.
0.682	"	"	"	sweep along fine gravel.
1.364	miles	"	"	roll along rounded pebbles one inch in diameter.
2.045	"	"	"	sweep along slippery angular stones as large as an egg.

Rivers in flood, even in the plain track, sometimes attain a velocity of over 5 miles an hour, and torrents may even flow as fast as 20 miles an hour. The course of a river is gradually carved out and shaped by the flow of the water. The sediment and stones carried along are powerful erosive agents in the torrential and valley tracks, and the character of the valleys or gorges produced depends largely on the geological structure of the region. The course of a river is frequently determined by lines of faults, but perhaps more often it appears to be independent of the nature of the strata. Some great rivers, notably the Volga, press against the right bank, cutting it into a steep cliff, while the left bank is left as a very gentle slope. This is explained by the directive influence of the earth's rotation.

Rivers are of very great importance as agents of change in dynamic geology, the form of valley they excavate being determined partly by the nature of the rocks, partly by the climate. In rainless or arid regions steep-walled cañons are cut to a great depth across high plateaus; in rainy regions subaërial denudation leads to the formation of wide valleys of much gentler slopes. Bars of more durable rock crossing the course of a stream lead to the formation of waterfalls or rapids from the rapid erosion of the softer strata below. The river above the obstruction is reduced to what is termed the base level of erosion; the velocity of the current is checked, and wide alluvial deposits are laid down on either side. In course of time the bar of hard rock is completely cut through by a gorge, and the gradient of the stream is ultimately rendered uniform. In this way the common features of gorge and meadow are produced again and again along the course of a stream. The deposits of alluvium form terraces along the valley track of a river, and as the stream cuts its channel deeper they are left at various heights as monuments of its erosive power. When a river is fairly established in its valley it is, geologically speaking, a more permanent feature than lakes or mountains. Upheaval, which acts very slowly, may even elevate a range of mountains across its course, yet all the while the river, cutting its way downward, remains at the same absolute level. The Uintah mountains, as they were upheaved, were divided in this way by the Green river, the chief tributary of the Colorado. In limestone regions the solvent power of river water on carbonate of lime leads to the formation of caves and underground rivers, which, as a rule, emerge from their subterranean channels on lower ground. Sometimes they do not reappear on land, but discharge their fresh water through openings in the bed of the sea. Such submarine river entrances are not uncommon along the shores of the Adriatic, off the coast of Florida, and in other calcareous regions. When a river advances along a nearly level plain toward the sea its carrying power falls off; gravel, sand, and finally mud are deposited on its margin, and the stream pursues a peculiar winding course. During a flood the swift and muddy stream rises, overflows its banks, and widens out on the level land. The current is at once checked and a long bar of deposit forms along each margin. These are increased in height by each successive flood, and, the river-bed being simultaneously silted up, broad muddy rivers like the Mississippi, Po, and Hoang-ho come in time to flow along the top of a gently sloping natural embankment, the sides of which are termed levees in Louisiana. The entrances of rivers into lakes or the sea are usually marked by great banks of deposit, or by bars of gravel or sand. In some cases, however, such as the River Plate, the Thames, and Tay, the mixture of river and sea water is gradual, and the sandbanks are spread over a very large area, but not built up into a delta at any one place. In a few instances, such as the Forth, rivers enter deep arms of the sea in which neither banks nor bars are formed. The Congo sweeps directly into the ocean, throwing down great banks of deposit along the continental slope to right and left, but leaving a deep cañon-like gully for the bed of the stream itself; a similar condition occurs where the Rhône enters the Lake of Geneva.

The ultimate source of all rivers is the condensation of water vapor from the atmosphere in the form of rain, snow, and even dew. If the land were composed of impermeable rocks all the rainwater not lost by evaporation would run off directly over the surface, and rivers would only flow during and immediately after showers. A large part of the rainfall, however, soaks into the soil, which retains it as in a sponge, especially if the land be marshy, and allows it to flow off gradually as superficial springs.

Some also percolates deeply into the rocks, ultimately emerging as deep-seated springs at a great distance. When a river flows toward a region of great evaporation and small rainfall, such as exists in the interior of each of the great continents, evaporation removes more water than is supplied by the remote tributaries, and the stream may fail to fill the hollow it enters, and therefore cannot overflow into the sea. This is the case with the Oxus entering the Aral sea, and the Volga entering the Caspian. It may be that evaporation is so far in excess of contributions from distant rainfall or snow-melting that the river dries up as it flows, and its last remnant is absorbed in the desert sand. This is the fate of the Murghab, the Heri-rud, the Zerafshan, and many other rivers of central Asia.

The annual inundations of the Nile are due to the monsoon rainfall on the great mountains of Abyssinia. The Orinoco is another instance of seasonal rains producing tremendous inundations, over 40,000 square miles of Llanos being said to be laid under water by the summer rains. The Amazon is an instance of a river which is always more or less in flood as the various tributaries attain their greatest height at different seasons. The Ganges overflows its banks in summer when the monsoon rainfall is reinforced by the melting of snow on the Himalayas. Where the seasons of maximum rainfall and of snow-melting are different, as in the Mississippi, the Tigris, and Euphrates, there are two regular floods in the year.

The danger of flooded rivers arises from the suddenness with which the water rises and overflows narrow valleys or even plains. Frightful devastation follows the bursting of glacier obstruction lakes in mountain valleys. The most serious floods in the Danube and Theiss have resulted from the constriction of the channel at the Iron Gates, which prevents the flood water from passing away as rapidly as it comes down; the current of the Theiss is sometimes reversed for many miles. Great rivers which have embanked their course above the level of the plain are the most dangerous of all when flooded. The damage caused by the bursting of the levees on the lower Mississippi necessitates a great expenditure in strengthening the embankments, and the most disastrous inundations recorded in history have followed the bursting of the banks of the Hoang-ho and its consequent changes of course.

River water is spoken of as fresh, but it always contains a certain amount of solid matter in solution, varying from two grains in the gallon or less in rivers draining hard crystalline rocks to 50 grains in the gallon or more in limestone districts.

The temperature of rivers, as a rule, follows that of the air, but is subject to variations on account of the effect of rain.

The great rivers of Europe and Asia, such as the Rhine, Danube, Volga, Indus, Ganges, Brahmaputra, Yang-tse-kiang, afford access to the sea to enormous populations. The Amazon, with its plain track extending for nearly 3,000 miles, is in many ways less like a river than a fresh inland sea; but the Mississippi and St. Lawrence, though less extensive, are of greater value for carrying sea traffic to inland places. In their torrential and upper valley tracks rivers are of use chiefly for transporting timber and driving machinery. It is interesting to note that in Switzerland, Norway, and Sweden, where there is no coal, there exist exceptional facilities for the use of water power on account of numerous mountain torrents. In hot countries rivers are of the utmost service in irrigating agricultural land; the Zerafshan and Murghab are entirely consumed in that service, and since the completion in 1890 of the barrage on the Nile no water escapes to the Mediterranean in the low Nile months except along irrigation canals.

The largest rivers of the world, with their length in miles, are: Amazon, 4,000; Nile, 3,766; Yangtse, 3,400; Yenisei, 3,300; Mississippi, 3,160; Missouri, 3,000; Congo, 3,000; Lena, 2,800; Niger, 2,900; Ob, 2,300; Hoang-ho, 2,600; Amur, 2,500; Volga, 2,300; Mackenzie, 2,525; La Plata, 2,300; Yukon, 2,300; St. Lawrence, 2,150; Rio del Norte, 1,800; São Francisco, 1,200; Danube, 1,725; Euphrates, 1,700; Indus, 1,700; Brahmaputra, 1,680; Zambesi, 1,600; Ganges, 1,500; Mekong, 2,500; Amu Daria, 1,500; Ohio, 950.

The pollution of rivers has of late years, in consequence of the extension of manufactures, caused serious concern. No person has a right to poison or pollute a stream, and if he do so any of the persons whose lands abut on the stream lower down may bring an action to recover damages. At common law, indeed, in every question of river pollution, the real question of fact is whether there has been any material increase of pollution beyond that which is natural to the particular stream, or beyond that which has existed there for the prescriptive period. Questions of river pollution are eminently fitted for submission to a jury, and are generally disposed of in that way.

In the United States the common law of England was at first followed; but in some of the States it is expressly declared that the common law is inapplicable. Mining rights have been specially determined in some districts; and the laws as to irrigation rights have been elaborately defined in Colorado and elsewhere.

RIVER CRAB, a name given to a genus of crabs (*Thelphusa*), inhabiting fresh water, and having the carapace quadrilateral and the antennæ very short. One species (*T. depressa*) inhabits muddy lakes and slow rivers in the S. of Europe.

RIVER HOG, the name occasionally given to the capybara.

RIVER HORSE, a name sometimes given to the HIPPOPOTAMUS (*q. v.*).

RIVER ROUGE, a village of Michigan, in Wayne co. It is on the Detroit and Toledo Shore and the Michigan Central railroads. It has important industries, including shipyard and bridge and steel works. Pop. (1910) 4,163; (1920) 9,822.

RIVERSIDE, a city and county-seat of Riverside co., Cal.; on the Santa Ana river, and on the Atchison, Topeka and Santa Fé, Riverside, Rialto and Pacific, and other railroads; 118 miles N. W. of San Diego. Here are a high school, Federal Indian School, libraries, several National and State banks, and a number of daily and weekly newspapers. The city is in a fruit-growing section noted for its oranges, lemons and raisins, and has extensive irrigating canals. Pop. (1910) 15,212; (1920) 19,341.

RIVES, ALFRED LANDON, an American engineer; born in Paris, France, March 25, 1830; studied at the University of Virginia; was graduated at the Ecole des Ponts et Chaussees, Paris, in 1854; was assistant engineer on the completion of the National Capitol, Washington; engineer in the construction of the aqueduct in Washington; and was in charge of the United States survey for improving the Potomac river. During the Civil War he was colonel of engineers in the Confederate army. After the war he was at different times an engineer on several railroads; and general manager and superintendent of many engineering works; also chief engineer of the Cape Cod Canal. He died in 1903.

RIVES, AMELIE, an American novelist, born in Richmond, Va., Aug. 23, 1863. At an early age she contributed short stories to magazines and newspapers. A series of stories composed her first book, "A Brother to Dragons." "The Quick or the Dead," a unique type of fiction first published serially in "Lippincott's Magazine," in 1890, was her first success. It was afterward published in book form. "According to St. John" first appeared in the "Cosmopolitan" magazine, and then in book form, in 1891. Other books by this author are "Virginia of Virginia," and "Athelwold." She became the wife of John A. Chanler in 1888. They were divorced on account of incompatibility. In 1896 she married the son of a Russian Prince, Pierre Troubetskoi, an artist. She also wrote, "Herod and Mariamne," "Witness of the Sun," "Barbara Dering," "Tanis," etc., and several plays, including "The Prince and the Pauper," based on Mark Twain's romance (1920).

RIVES, GEORGE LOCKHART, an American lawyer and historical writer, born in New York City in 1849. He graduated from Columbia University in 1868 and studied law at that university and at Trinity College, Cambridge. In 1874 he was admitted to the bar and practiced in New York City for many years. From 1896 to 1902 he was a member of the Rapid Transit Railroad Commission, and was corporation counsel from 1902 to 1904. From 1887 to 1889 he served as Assistant Secretary of State of the United States. He was a student of the relations between the United States and Mexico, and published in 1913 "The United States and Mexico, 1821–1848." He was a member of the American Academy of Arts and Letters and was president of the Board of Trustees of the New York Public Library. He died in 1917.

RIVET, a short bolt with a flat or rose head, employed for uniting two plates or thin pieces of material. The stub end is swaged to prevent its withdrawal. When used for joining pieces of leather, as in making belting, an annular disk, termed a burr, is placed over this end previous to swaging, in order to give a greater bearing. Rivets are cut from round metal rods and formed by special machinery. In riveting iron plates together, as in boilers, tanks, etc., the rivet is made red-hot, and while a sledge is held against the head, the end is swaged down by striking directly with a riveting hammer, or a species of die called a snaphead is interposed. Riveting machines are stationary and portable. The first does heavy work by pressure of steam and hydraulic power; the portable by steam or compressed air, producing blows like a hammer. They drive

and head hot rivets in boiler work and structures better and more rapidly than hand work.

RIVOLI, a town of northern Italy, 8 miles W. of Turin, with two royal castles and some industry. Another town, known by the name of Rivoli Veronese, 12 miles N. W. of Verona, was where Napoleon won on Jan. 14 and 15, 1797, one of his most decisive victories over the Austrians.

RIZAL, JOSÉ, a Filipino patriot; born in Calamba, Luzon, in 1861. He was the son of unmixed Tagal parents, who destined him for the Church. He received his early education in his native town under a Tagal priest. Later he was sent to Manila, where he entered a Jesuit school, the Ateneo Municipal. At this time José assumed the name of Rizal, as his brother's friendship for a revolutionist priest had brought the family name, Mercado, into great disfavor with the Spaniards. In Manila José soon learned of the reproach attached to his Tagal origin. He was denied the honors due him as head of his class, and met with derision and hatred from the Spanish students. In many ways his prejudices against the Spanish were roused. Though he had been destined for the Church, he studied for and took his medical degree at Manila. Then he went to Paris, Heidelberg, Leipsic, and in all these cities he continued his medical studies. At the same time he developed his interest in social and political problems. He learned that Europe was almost ignorant of the Philippines, so he wrote a novel, portraying his birthland, which was published in Berlin in 1887. This book was forbidden by the Church. He wrote a sequel to it which was published at Ghent in 1891. His portrait-bust of the Filipino-Creole, Dr. T. H. Pardo, was exhibited in the Salon. In 1887 Rizal went to Hong Kong where he organized the famous Liga Filipino, or Philippine League, which was the source of the "Revolutionary Society of the Sons of the Nation." During several years of travel he constantly agitated Filipino revolt, and then in May, 1892, returned to Manila. He was arrested and exiled to Dapitan. In 1895 he was permitted to return to Luzon. He was, however, arrested at Barcelona and transshipped to Manila, tried and condemned to death. His last wishes, that he might be united by civil marriage with Miss Josephine Bracken, whom he first met in Hong Kong, and the other, that he should be shot through the breast, were granted. He was shot by a picket of native soldiers, Dec. 30, 1896, and his last words were, "Consummatum est!"

RIZZIO, DAVID, a native of Turin, came to Scotland in 1561 in the train of the ambassador from Savoy, and soon became so great a favorite with the queen that he was appointed her secretary for foreign languages. The distinction with which he was treated by his mistress soon excited the envy of the nobles and the jealousy of Darnley. A conspiracy, with the king at the head, was formed for his destruction, and before he had enjoyed two years of court favor the Lord Ruthven and others of his party were introduced by Darnley into the queen's apartment, where they dispatched the object of their revenge, March 9, 1566.

ROACH, a fish of the family *Cyprinidæ*, abundant in England, the S. of Scotland, and many countries of Europe. It measures from 10 to 15 inches; the body generally has a silvery appearance, the back is a dull green, the lower fins are red, and there are no barbels.

ROAD AND STREET MACHINERY, appliances used in the preparation and preservation of roads are of various types and may be classified as under:

Plows and Scrapers.—Plows used in this work are of the ordinary pattern and call for no detailed description. Scrapers usually consist of a steel blade, mounted between two wheels, and so contrived that its cutting depth and inclination are capable of adjustment. A special type of plow is known as a *grader*. This machine cuts into the earth and loosens it, and then lifts it on to a moving belt which conveys it to the roadway.

Stone Crushers are described in detail under "Grinding, Crushing and Pulverizing Machinery." They are used in reducing large stones to a size suitable either for surfacing macadam roads, or for mixing with cement in the preparation of concrete.

Rollers, although now very familiar, are of comparatively recent origin, the first road roller being constructed in 1787 in France. Their obvious use is to compress the road-bed and upper layers, in order to produce a hard, durable and smooth surface. Steam rollers are commonly seen in the United States, but motor driven and horse drawn rollers are also used. Steam rollers may weigh as much as 20 tons, but the lighter horse-drawn machines sometimes do not exceed 2 tons.

Spreaders consist of a container, in which the load of stones is carried, and which can be tilted to any desired angle. In this way the quantity of stone dumped on to the road may be adjusted. Behind the container is a drag

with a movable scraper, by means of which the depth of stones may be regulated.

Sprinklers are used for spreading water, oils and various tarry preparations on the surface of roads, in order to lay dust and produce a more even and less easily pulverized surface. They consist of a tank, mounted on wheels, carrying a perforated pipe behind. Modern sprinklers are sometimes fitted with steam boilers for heating the liquid, and with air compressors, by means of which the material may be forced through nozzles in a spray.

Sweepers and Scrapers, used in cleaning streets, are of various types. The sweepers usually consist of a cylindrical brush, which revolves as the framework on which it is mounted is hauled along. More elaborate machines pick up the dirt as it is swept by the brush, some by means of a conveyor, others by means of a suction device, similar to the well-known vacuum cleaner. Most of these machines are horse drawn, but motor vehicles are also in use. Scrapers may consist of a row of curved blades attached to movable rods which enable the blades to yield to irregularities in the surface of the road. Small, manual types are familiar, as well as larger horse-drawn machines.

Scarifiers are used in loosening the surface of macadam roads, when under repair. They are of various patterns, but consist essentially of metal spikes which scrape or drill into the road to a depth sufficient to loosen the surface. The spikes are sometimes fixed to the front of steam rollers.

ROADS, artificial pathways formed through a country for the accommodation of travelers and the carriage of commodities. Though the Romans set an example as road-builders, some of their public highways being yet serviceable, the roads throughout most of Europe were in a wretched condition till toward the end of the 18th century. France was in advance of other countries in road making; in England a decided improvement of the highways only began in the 19th century. When diversities of level are necessary, road engineers fix the degree of inclination at the lowest possible point. Telford estimated the maximum inclination of a road to be 1 in 24, but, except in extreme cases, it is considered better that it should not exceed 1 in 50. The angle of repose, or maximum slope on which a carriage will stand, has been estimated at 1 in 40. A properly constructed road, besides a foundation, consists of two layers, an upper and an under. After a good foundation is obtained the laying of a base, the best material being concrete of gravel and lime, gives durability to the road. On this base the actual roadway is laid with a slight inclination from the center to the sides for the purpose of drainage. Before the time of Macadam it was customary to use broken stones of different sizes to form the roadway, the consequence being that in course of time the smaller stones sank, making the road rough and dangerous. Macadam early in the 19th century (see MACADAM) introduced the principle of using stones of uniform size from top to bottom. The general superintendence of roadways is usually exercised by the government of a country, but it intrusts the execution of its enactments to local authorities. Highways are public roads which every citizen has a right to use. They are constituted by prescription, by act of legislature, or by dedication to the public use. What is known as the rule of the road is that in passing other horsemen or carriages, whether going in the same or the opposite direction, the rider or driver must pass on the right hand of the other rider or driver. Automobiles and bicycles are subject to the same restrictions and are entitled to the same privileges as ordinary vehicles.

ROANNE, France, a town in the department of the Loire, important as a railroad junction, situated on the left bank of the Loire, 42 miles N. W. of Lyons. In connection with the railroads large machine shops and engineering works are located here. Other important industries are copper and iron foundries, dye works, and textile mills. Pop. about 37,000.

ROANOKE, a city in Roanoke co., Va.; on the Roanoke river, and on the Norfolk and Western and Virginian railroads; 56 miles W. of Lynchburg. It is in a section rich in iron mining and farming interests. Here are a high school, the Virginia College (women), Rebekah Sanitarium and six hospitals; improved sewer system, waterworks, street railroad and electric light plants, National and State banks, several hotels, and daily, weekly, and monthly periodicals. It has large machine shops, rolling mills, bottle works, tobacco factories, locomotive and car works, iron and steel works, canning factories, spoke factories, saw and planing mills, coffee and spice mills, and many smaller industries. Pop. (1910) 34,874; (1920) 50,842.

ROANOKE, a river of the United States, in Virginia and North Carolina. It flows chiefly S. E., and after a course

of about 450 miles falls into Albemarle sound. It is tidal for 75 miles and is navigable for double that distance for small vessels.

ROANOKE COLLEGE, an educational institution in Salem, Va.; founded in 1853, under the auspices of the Lutheran Church; reported at the close of 1919: Professors and instructors, 19; students, 220; president, J. A. Morehead, D.D.

ROARING, in horses, a disease of the nerves and muscles of the larynx which causes an obstruction to the passage of air, giving rise, when the horse is briskly exercised, to the peculiar sound from which the disease derives its name. The cause of the disease is in most cases attributed to fatty degeneration and atrophy of the laryngeal nerve, which brings about an atrophy of the muscles of the larynx on the side affected, and thus causes the arytenoid cartilage to obstruct the passage. The disease generally affects the left side, and is not, as a rule, amenable to treatment. Cases have been cured by excision of a portion of the affected arytenoid cartilage.

ROASTING, the cooking of meat by the direct action of fire—that is, by dry heat, either before the fire or in an oven. Roasting before an open fire is considered preferable to roasting in an oven (which is analogous to baking), on account of the free ventilation to which it exposes the meat during the process. The apparatus in most kitchens for open roasting are a fire, a spit, a contrivance for turning the meat to present all sides of it alternately to the fire, a screen to economize the heat, and a saucepan to catch the dripping.

ROBBERY, the unlawful taking away of money or goods of any value from the person of another, or in his presence, either by violence or by putting him in fear. Hence, in order to constitute robbery, there must be: (1) An unlawful taking. (2) The thing must be of some value, but it is immaterial, as constituting the offense, whether it be a cent or a dollar. (3) The taking must be by force, or a previous putting in fear. It is this last which distinguishes robbery from other larcenies, and makes the violation of the person more atrocious than private stealing. The taking must also be either directly from the person or in his presence, or it is not robbery. The thing taken must have been in the possession of the thief, and if he once has it in his possession, even though he immediately restore it, he is still guilty of robbery. In the United States robbery is punishable according to the laws of the various States.

ROBBIA, LUCA DELLA, an Italian sculptor; born in Florence in 1399 or 1400. He designed and executed between 1431 and 1440 10 panels of "Angels and Dancing Boys" for the cathedral. Another great work by him was a bronze door, with 10 panels of figures in relief for the sacristy of the cathedral, made between 1448 and 1467. In marble he sculptured, in 1457-1458, the tomb of Federighi, Bishop of Fiesole (now in the church of San Francesco outside the city). His name is closely associated with the production of figures in glazed or enameled terra cotta, by a process he perfected. Among the works of this kind are many medallions, some white, some polychrome, and reliefs. He died in Florence, Feb. 20, 1482. His principal pupil was his nephew ANDREA (1435-1525), who worked chiefly at the production of enameled reliefs, retables, and medallions, these last for the most part productions of the "Madonna and Child." Nearly all his works were of religious subjects; they were made chiefly for Florence, Arezzo, and Prato. His son GIOVANNI (1469-1529?) continued the activity of the family in this style of work; his best productions are the frieze, representing the "Seven Works of Mercy," outside a hospital at Pistoja, and a fountain in the sacristy of St. Maria Novella in Florence.

ROBBINS, HOWARD CHANDLER, an American Protestant Episcopal clergyman, born at Philadelphia, in 1876. He was educated at Yale University, Princeton Theological Seminary, and the Episcopal Theological School, Cambridge, Mass. He became a deacon in 1903 and a priest in 1904. From 1903 to 1905 he was curate at St. Peter's Church, Morristown, N. J.; from 1905 to 1911, rector of St. Paul's Church, Englewood, N. J.; and from 1911 to 1917 rector of the Church of the Incarnation, New York. In 1917 he became dean of the Cathedral of St. John the Divine, New York City.

ROBECK, VICE-ADMIRAL, SIR JOHN MICHAEL DE, a British naval officer. He was born in 1862 and was educated on the training ship, Britannia. In 1875 he entered the Royal Navy as cadet and became lieutenant in 1885. In 1897 he was made commander, in 1902 captain, and in 1911 rear-admiral. He was Admiral of Patrols in 1912-14. During the World War he commanded the Naval Force in the Dardanelles at the time the Expeditionary Force was landed in 1915 and was mentioned in despatches. In 1917 he was made vice-admiral. He

was for a time Inspector of Boys' Training Establishments. During 1919 he was Commander-in-Chief in the Mediterranean.

ROBERT, DUKE OF NORMANDY, surnamed THE DEVIL; the younger son of Duke Richard II. by his marriage with Judith, a daughter of Count Godfrey of Brittany. In 1028 he succeeded his elder brother, Richard III., whom he is charged with having poisoned. The first years of his government were employed in bringing his rebellious vassals into subjection, and he then restored Count Baldwin of Flanders to his states, assisted Henry I., King of France, against his mother Constantia, and humbled Count Otho of Champagne. In 1034 his fleet was wrecked off Jersey while on its way to England to support his nephews Alfred and Edward against Canute, who had excluded them from the succession to the English throne. Hereupon he concluded a truce with Canute, by which the two princes were promised half of England. In 1033 he set out to visit the holy places, and subsequently made the pilgrimage to Jerusalem on foot. While returning he died suddenly in Nicæa in Asia Minor (1035), and is supposed to have been poisoned by his servants. William the Conqueror was his son.

ROBERT I. See BRUCE, ROBERT.

ROBERT II., King of Scotland; born in Scotland, March 2, 1316; the son of Marjory, daughter of Robert Bruce, and of Walter, steward of Scotland, and was thus the first of the Stewart or Stuart kings. He was recognized by Parliament in 1318 as heir to the crown. On the death of David II. he was crowned at Scone, March 26, 1371. He had long acted as regent, and had done good service in the English wars. An act of Parliament in 1375 settled the crown on his sons by his first wife Elizabeth Mure of Rowallan, illegitimate by ecclesiastical law. His reign was comparatively a peaceful one, one of the chief events being the battle of Otterburn. He died in Dundonald Castle, May 13, 1390.

ROBERT III., King of Scotland, eldest son of the preceding; born in 1340 and was originally called John, but changed his name on his coronation in 1390. Having been lamed by accident, he was unable to engage in military pursuits, and he trusted the management of affairs almost entirely to his brother, whom he created Duke of Albany. In 1398 Albany was compelled to resign his office by a party who wished to confer it on the king's eldest son, David, Duke of Rothesay. War was renewed with England, and the battle of Homildon Hill, Sept. 14, 1402, resulted in a disastrous defeat of the Scotch. In this year the Duke of Rothesay died in Falkland Castle, where he had been imprisoned; and it was commonly believed that he was starved to death at the instigation of Albany. Dread of Albany, who had recovered the regency, induced the king to send his second son, James, to France in 1406; but the vessel which carried him was captured by the English, and Henry IV. long detained him as a prisoner. Soon after this event Robert died in Rothesay, Bute, in 1406.

ROBERT COLLEGE, a Christian institution of learning in Hissur, a suburb of Constantinople, founded in 1863 by Christopher R. Robert, a wealthy resident of New York. The Rev. Cyrus Hamlin, D. D., was its first president. Mr. Robert supported the institution till his death in 1878, and then bequeathed to it one-fifth of his estate. His gifts to the institution amounted in all to about $450,000. The college was incorporated as a branch of the University of New York in 1864. The permission to erect suitable buildings was given by the Sultan in 1869. The two main buildings were erected respectively in 1871 and 1893. The course of study is similar to that of an American college, with special stress laid on the teaching of English. There is a preparatory course of five years. During the World War the buildings of the college were used as a hospital. Over 3,500 students have graduated since the foundation of the institution. President, Caleb F. Gates, D.D., LL.D.

ROBERT, HENRY MARTYN, an American army officer, born at Robertville, S. C., in 1837. He graduated from the United States Military Academy in 1857 and in the same year was made 2nd lieutenant of engineers. Rising through the successive ranks of the service, he became chief of engineers of the United States Army, with the rank of brigadier-general, on April 30, 1901, but was retired on May 2 of the same year, after having reached the legal age limit. The most important assignments of his military career included service at the United States Military Academy, in 1856-7, and again in 1865 to 1867; the command of the exploration party of a military route from Vancouver to Puget Sound, in 1860; engineer in charge of defenses of Philadelphia, in 1861-2, and of New Bedford, from 1862 to 1865; chief engineer of the Military Division of the Pacific, from 1867 to 1871; engineer in charge of various light house districts and river and harbor improvements, from 1871 to 1895; president of the United States Board of Engineers for

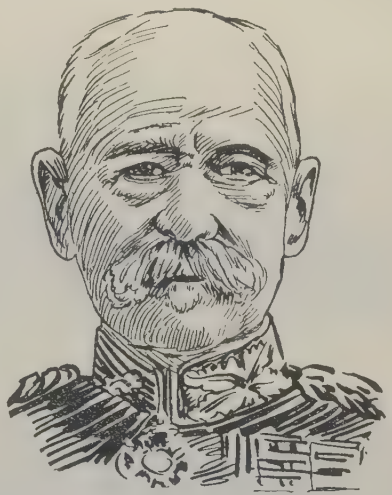
Fortifications, from 1895 to 1901. In 1901-2, and again in 1915, he was a member of the commission to design a sea-wall for Galveston. He published "Robert's Rules of Order" (1876, 1893, 1915); and "Index to Reports of Chief of Engineers U. S. A., on River and Harbor Improvements, from 1866 to 1887" (2 volumes, 1881, 1889).

ROBERT OF GLOUCESTER, an English chronicler, living at the time of the battle of Evesham (1265). He is remarkable for a metrical chronicle of England, from the time of the fabulous Brut to his own, based chiefly upon Geoffrey of Monmouth's book. It extends to 10,000 lines, and is one of the earliest epics of the English language. It was printed by Thomas Hearne in 1724.

ROBERTS, ELLIS HENRY, an American journalist and financier, born in Utica, N. Y., in 1827. He graduated from Yale University in 1850, and in the following year became editor and proprietor of the Utica Morning Herald. He was a member of the State Legislature in 1866, and was elected to Congress in 1871, serving until 1875. From 1889 to 1893 he was Assistant Treasurer of the United States, and Treasurer of the United States from 1897 to 1905. He wrote "Government Revenue" (1888); "New York, the Planting and Growth of the Empire State" (1887; 1904). He died in 1918.

ROBERTS, FRANK HUNT HURD, an American educator, born at Mt. Vernon, Ohio, in 1869. He was educated at the Ohio University, Kenyon College, and the University of Denver. From 1889 to 1893 he devoted himself to newspaper work in Ohio, from 1889 to 1899 he acted as superintendent and principal of schools for various schools, from 1903 to 1914 he was professor of history at the University of Denver, and in 1914 became extra-mural professor at this institution. In September, 1910, he was made president of the New Mexico Normal University, Las Vegas, N. M. He was public lecturer on historical and pedagogical subjects, investigated municipal ownership in Europe on behalf of the University of Denver, in 1905, and was the director of the Wyoming educational exhibit at the Paris and St. Louis expositions. From 1911 to 1917 he was a member of the New Mexico State Board of Education. In 1916-17 he was president of the New Mexico Educational Association. During the World War he was the State chairman of the "Four-Minute Men," and of the National Security League. He was State president of the Y. M. C. A. from 1917 to 1919, and was also a member of the executive committee of the Interchurch World Movement. He was a member of several historical and educational societies, and published "A Comparative Study of the State and Nation" (1900); "Civil Government" (1902); "Civil Government of Wyoming" (1902); "History and Civics of New Mexico" (1918); and numerous articles to educational and political journals.

ROBERTS, FREDERICK, EARL, an English military officer; the son of an Indian officer, Gen. Sir Abraham Roberts; born in Cawnpur, India, Sept. 30, 1832. He was brought to England when two years old, educated at Clifton, Eton, Sandhurst, and Addiscombe, and entered the



FIELD-MARSHAL ROBERTS

Bengal Artillery in 1851. His first taste of actual warfare was got in the hot time of the siege of Delhi, during the Mutiny, and he took an active part in the subsequent operations down to the relief of Lucknow, acting on the staff, in the quartermaster-general's department, and he won the V. C. He discharged the duties of assistant quartermaster-general in the Abyssinian expedition of 1868, and in the Lushai expedition of 1871-1872. On the outbreak of the Afghan War in 1878, Roberts, now Major-General, was appointed to command the Kurram division of the army. He forced in brilliant fashion the Afghan position on the peak of Peiwar Kotul (8,500 feet above sea-level), and was rewarded with a knight-commandership of the Bath (1879). After the murder of Sir Louis Cavagnari and the escort of the British mission at Kabul, he was given command of the

force sent to avenge them. He defeated the Afghans at Charásia on Oct. 6, took possession of Kabul on the 12th, and assumed the government of the country, Yákúb Khan having abdicated. Events followed quickly: the fortified cantonment of Sherpur was occupied by the British army, the fortress of Bala Hissar in Kabul was dismantled, Yákúb Khan was sent a prisoner to India, the Afghans began to concentrate on Kabul, General Roberts sought to check them, and there was much sharp fighting round the city, Abdurrahman was proclaimed Ameer, and General Burrows was crushingly defeated at Maiwand, and the British garrison of Kandahar besieged by the followers of Ayub Khan. On Aug. 9 Sir F. Roberts set out with 10,148 troops, 8,143 native followers, and 11,224 baggage animals on his memorable march through the heart of Afghanistan to the relief of Kandahar, which he reached three weeks later. He immediately gave battle to Ayub Khan and routed him completely, capturing all his artillery and his camp. When he visited England toward the close of the year he was honored with a baronetcy, and on his return to India was appointed Commander-in-Chief of the Madras army (1881), and held the rank of Commander-in-Chief in India 1885-1893. He was appointed Commander-in-Chief of the forces in Ireland in 1895; and in 1899 took command of the English forces in South Africa; capturing Cronjé, relieving Kimberley, and annexing the two republics. He returned to England and was created Earl, and made Commander-in-Chief, which position he held until it was abolished in 1904. During the succeeding 10 years Lord Roberts urged upon his countrymen the need of more adequate military preparation, but he was little heeded. He died Nov. 14, 1914, while visiting the British lines in France.

ROBERTS, KENNETH LEWIS, an American author, born at Kennebunk, Me., in 1885. He was educated at Cornell University. Having served as editor-in-chief of the "Cornell Widow" during his under-graduate days; he became a contributor of fiction, special articles, light verse, etc., to "Life," "Puck," and many other periodicals. In 1916-17 he was on the editorial staff of "Puck." During the World War he served first as a captain of the Military Intelligence Division and later with the American Expeditionary Force in Siberia.

ROBERTS, MORLEY, an English novelist and journalist, born in London in 1857. He was educated in the public schools and at Owens College, Manchester. In 1874 he removed to Australia and was engaged in various employments. He traveled also in the United States and in the South Seas, Samoa, South Africa, and other parts of the world. He was a prolific writer and his stories of adventure attained wide popularity. They include "Red Earth" (1894); "The Colossus" (1899); "The Way of a Man" (1902); "The Private Life of Henry Maitland" (1912); "Gloomy Fanny" (1913); and "Sweet Herbs and Bitter" (1914).

ROBERTS, WILLIAM HENRY, an American Presbyterian clergyman, born at Holyhead, Wales, in 1844. He was educated at the College of the City of New York and at Princeton Theological Seminary, receiving honorary degrees from several American universities. From 1863 to 1865 he was statistician of the Treasury Department, and from 1866 to 1871, assistant librarian of Congress. In 1873 he was ordained a Presbyterian minister, and after some years as pastor of a church at Cranford, N. J., he was librarian of the Princeton Theological Seminary, from 1878 to 1886, and professor of practical theology at the Lane Theological Seminary, from 1886 to 1893. In 1884, he became stated clerk of the General Assembly of the Presbyterian Church in the United States; in 1888, American secretary of the Alliance of the Reformed Churches Throughout the World; and in 1907, secretary of the Council of Reformed Churches in the United States. He also served as treasurer of the Centenary Fund for Ministerial Relief (1888 to 1890), for the Anniversary Reunion Fund (1895 to 1897), and of the Twentieth Century Fund (1900 to 1902). In 1896, he was president of the Glasgow, Scotland, Pan-Presbyterian Council; from 1903 to 1909, secretary of the Interchurch Conference on Marriage and Divorce; in 1905, president of the Interchurch Conference on Federation, N. Y.; in 1907, moderator of the Presbyterian General Assembly; and in 1918-19, chairman of the Conference on Organic Union. He published "History of the Presbyterian Church" (1888); "The Presbyterian System" (1895); etc., and edited "Minutes of the General Assembly" (34 volumes) (1884 to 1919), etc. He died in 1920.

ROBERTSON, ARCHIBALD THOS., an American Baptist theologian, born near Chatham, Va., in 1863. He was educated at Wake Forest (N. C.) College, and at the Southern Baptist Theological Seminary, Louisville, Ky. In 1888 he was assistant instructor of New Testament interpretation; in 1892 professor of Biblical Introduction; and since 1895 professor of New Testament interpretation at the Southern Baptist Theological Sem-

inary, Louisville, Ky. In 1904 he became business manager of the "Review and Expositor." He wrote "Life and Letters of John A. Broadus" (1900); "Syllabus for New Testament Study" (1903); "The Students' Chronological New Testament" (1904); "Keywords in the Teaching of Jesus" (1905); "Epochs in the Life of Jesus" (1908); "Commentary on Matthew" (1910); "John the Loyal" (1911); "The Glory of the Ministry" (1911); "Grammar of the Greek New Testament in the Light of Historical Research" (1914); "Studies in New Testament" (1915); "Training for Citizenship" (1918). His "Short Grammar of Greek New Testament" (1908) was translated into the Italian, German, French, and Dutch languages. He also contributed to many biblical dictionaries and encyclopedias.

ROBERTSON, FREDERICK WILLIAM, an English preacher; born in London, Feb. 3, 1816. He attended the grammar school of Beverley, and in 1830 became a pupil of the Edinburgh Academy, and afterward attended the university of that city. Failing to obtain a commission in the army, he matriculated at Brasenose College, Oxford, in 1837, with a view to enter the Church. He was ordained in 1840, and took priest's orders a year later. He then went abroad, and at Geneva married the daughter of Sir George William Denys. From 1842 to 1846 he was curate at Christ Church, Cheltenham. He became incumbent of Trinity Chapel, Brighton, in 1847; and continued in this charge with increasing fame as a preacher till his death. His views on the Sabbath, the atonement, baptism, and inspiration were assailed as unorthodox, and he was accused of preaching democracy and socialism. His published works embrace "Lectures and Addresses on Literary and Social Topics" (8vo, London, 1858), "Analysis of Tennyson's In Memoriam" (1862), and sermons and lectures. He died in Brighton, August 15, 1853.

ROBERTSON, JAMES BURTON, an English historian; born in London, England, Nov. 15, 1800; studied literature, philosophy, and the elements of dogmatic theology, in France; and after various preliminary essays published a translation of Frederick Schlegel's "Philosophy of History" (1835) which passed through many editions. His second translation, "Symbolism, or Exposition of Doctrinal Differences between Catholics and Protestants" (1843), was also widely read in both England and America and created a profound impression. His original writings include: "Public Lectures on Some Subjects of Ancient and Modern History" (1859); "Lectures on Some Subjects of Modern History and Biography" (1864); and many others. He died in Dublin, Feb. 14, 1877.

ROBERTSON, JOSEPH, a Scottish antiquary; born in Aberdeen, May 17, 1810, was educated at Udny Academy, and the grammar school and Marischal College of his native city. An Episcopalian and Conservative, he was apprenticed to a lawyer, but took early to writing, and, after six years of literary work at Edinburgh was a newspaper editor at Aberdeen, Glasgow, and Edinburgh from 1839 to 1853. He was in that year appointed curator of the historical department of the Edinburgh Register House. He was an originator of the Aberdeen Spalding Club (1839-1870) for which he edited eight works. Of his other works may be noticed "The Book of Bon-Accord, or a Guide to the City of Aberdeen" (1839), "Catalogues of the Jewels, Dresses, Books, and Paintings of Mary, Queen of Scots" (Bannatyne Club, 1863), the invaluable "Concilia Scotiæ: Ecclesiæ Scoticanæ Statuta, 1225-1559" (1866), and an admirable article in the "Quarterly Review" for June, 1849, on "Scottish Abbeys and Cathedrals." He died Dec. 13, 1866.

ROBERTSON, THOMAS M., an American economist, born in Alamance co., N. C., in 1857. Until 1887 he taught school. From 1893 to 1895 he was a member of the N. C. house of representatives; from 1895 to 1897 he was connected with the United States Treasury Department, and from 1897 to 1903 with the Department of Labor. From 1904 to 1915 he was special examiner in the Bureau of Corporations, in charge of investigations of water power, cotton and lumber. From 1915 to 1917 he was assistant chief economist and a member of the Joint Board of Review of the Federal Trade Commission, becoming in 1917 chief economist.

ROBERTSON, SIR WILLIAM (ROBERT), a British military officer. He was born at Welbourne, Lincolnshire, England, in 1860 and was educated privately. In 1888 he became a lieutenant in the 3rd Dragoon Guards, and in 1891 was railway transport officer in the Miranzai and Black Mountain Expeditions. In 1892-96 he was Staff Captain and D. A. Q. M. G., Intelligence Branch, Simla, and in 1895, Intelligence Officer, Headquarters, Chitral Relief Force, where he was severely wounded. He was in the South African War in 1900 and was Assistant Director of Military Operations in the War Office, 1901-7. In 1907 he was A. Q. M. G. at Aldershot and in 1910-13, Com-

mandant, Staff College. In 1913-14 he was Director of Military Training at the War Office. In the World War he commanded the 1st Infantry Division and Chief of General Staff 1915-18, General Officer, Commander-in-Chief Eastern Command, 1918, Great Britain, 1918-19.

GENERAL SIR WILLIAM ROBERTSON

ROBESPIERRE, MAXIMILIEN MARIE ISIDORE, a French revolutionist; born of a family of Irish origin, in Arras, May 6, 1758. His mother died in 1767, his broken-hearted father two years later, and the four children were brought up by their maternal grandfather, an Arras brewer. Maximilien, the eldest, early showed unusual promise, and was educated at Arras and at the College Louis-le-Grand at Paris. He was admitted *avocat* in 1781, and next year was named criminal judge by the Bishop of Arras, but resigned his place soon after to avoid passing a sentence of death. All through life a fanatical devotee of the Gospel according to Rousseau, his sentimentality and taste for verses made him popular among the Rosati at Arras. He drew up the *cahier* or list of grievances for the guild of cobblers, and was elected to the States-General in 1789 as one of the deputies for the *tiers état* of Artois. He soon attached himself to the extreme Left—the "thirty voices," and though his first speeches excited ridicule, it was not long before his earnestness and his high sounding phrases commanded attention. Indeed his influence grew daily, both in the Jacobin Club and in the Assembly.

Three days after the death of Mirabeau he called on the Assembly to prevent any deputy from taking office as minister for four years, and in the following month (May, 1791) carried the motion that no member of the present Assembly should be eligible for the next. Next followed Robespierre's appointment as public accuser, the king's flight to Varennes (June 21), Lafayette's last effort to control the sacred right of Insurrection on the Champ-de-Mars (July 17), the abject terror of Robespierre, his sheltering himself in the house of Duplay, a carpenter, his hysterical appeal to the club, the theatrical oath taken by every member to defend his life, and his being crowned with chaplets, along with Pétion, and carried home in triumph by the mob at the close of the Constituent Assembly, Sept. 30.

He went to Arras, where he sold his small patrimony and returned to Paris, to the house of Duplay, where he remained till the last day of his life. He was much beloved in the family, and a passion quickly sprung up betwixt himself and his host's eldest daughter, Elénore, a romantic girl of 25. Alone among the patriots he was noted for the carefulness of his dress—powdered hair, a bright blue coat, white waistcoat, short yellow breeches, with white stockings and shoes with silver buckles.

Meantime the Girondist party had been formed in the new Legislative Assembly, its leaders—the loudest, Brissot—eager for war. Robespierre, who ever feared and disliked war, offered a strenuous opposition in the debates of the Jacobin Club. Fundamentally an empty pedant, inflated with words which he mistook for ideas, in his orations he is ever riding in the air on theories, his foot never on the solid ground of the practical. In April, 1792, he resigned his post of public prosecutor. He was invisible during the crisis of August 10, but joined the Hôtel-de-Ville faction, and on August 16 he presented to the Legislative Assembly its petition for a Revolutionary Tribunal and a new Convention. He was elected first deputy for Paris to the National Convention, which opened on Sept. 21.

The bitter attacks on him by the Girondists were renewed only to throw Robespierre into a closer union with Danton and his party, but the final struggle was interrupted for a little by the momentous question of the king's trial. Robespierre

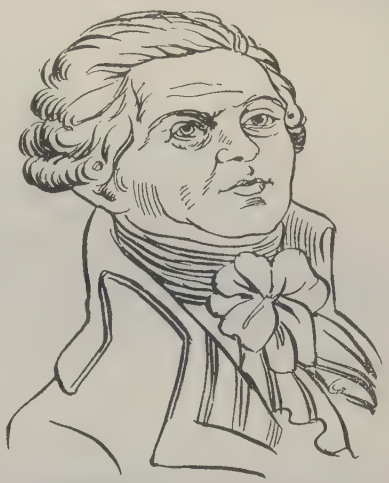
opposed vigorously the Girondist idea of a special appeal to the people on the king's death, and his execution (Jan. 21, 1793) opened up the final stage of the struggle, which ended in a complete triumph of the Jacobins on June 2 of the same year. The first Committee of Public Safety—a permanent Cabinet of Revolution—was decreed in April, 1793, but Robespierre was not elected till July 27.

He was now for the first time one of the actual rulers of France, but it is open to question whether for the whole 12 months from this time to the end he was not merely the stalking horse for the more resolute party within the Twelve. His vaunted respectability, his great popularity with the mob, and his gift of fluent, if vague and windy, oratory, made an admirable cover for the truculent designs of strong and completely unscrupulous men like Billaud-Varennes and Collot d'Herbois and at least it is certainly the case that Couthon and Saint-Just were the only members whose political and social ideals coincided with his own.

The next scenes in the dark drama of Revolution were the intrigues and desperate struggles that sent Hébert and his friends to the scaffold on March 24, 1794, and Danton and Robespierre's school-fellow, Camille Desmoulins, on April 5. Danton he at once hated and feared with that fierce and spiteful hatred he ever felt instinctively for men with natural gifts beyond his own. The next three months he reigned supreme, but his supremacy prepared the way for his inevitable fall. He nominated all the members of the government committee, placed his creatures in all places of influence in the commune of Paris, sent his henchman Saint-Just on a mission to the armies on the frontier, assumed supreme control of the Revolutionary Tribunal, and completely revolutionized its method of operation by the atrocious measure introduced by his creature Couthon on the 22d Prairial (June 10), to the effect that neither counsel nor witnesses need be heard if the jury had come otherwise to a conclusion.

But, in accordance with the law that governs all human things, as Robespierre's power increased his popularity decreased. His declaration on May 7 of a new religion for the State—the foundation of a new régime of public morality —awakened in the mind of Paris the slumbering sense of humor. The Convention at Robespierre's instance agreed to compliment the Supreme Being with an acknowledgment of His existence and themselves with the Consolatory Principle of the Immortality of the Soul, to be celebrated in 36 annual festivals. The first of these was held on June 8, when Robespierre, glorious in a new light-blue coat, walked in front of the procession and delivered his soul of a vapid harangue, and set fire to pasteboard figures representing Atheism, Selfishness, Annihilation, Crime, and Vice.

Meantime the pace of the guillotine grew faster, though apparently Robespierre hoped to bring it to a close as soon as all his more dangerous enemies, like Tallien, Fouché, and Vadier, were cut off. At the same time the public finance and the work of government generally drifted to ruin, and Saint-Just openly demanded the creation of a dictatorship in the per-



MAXIMILIEN M. I. ROBESPIERRE

son of Robespierre as alone possessing intellect, energy, patriotism, and revolutionary experience enough. On July 26 (8th Thermidor), after about a month's absence, the dictator delivered a long harangue complaining that he was being accused of crimes unjustly. He was listened to in deep unsympathetic silence, and the Convention, after at first obediently passing his decrees, next rescinded them and referred his proposals to that committee, and the sitting ended without anything being concluded. That night at the Jacobin Club his party again triumphed, and the Tallien party in despair hurried to the members of the Right, the Girondist remnant, and implored their help against the common enemy at this desperate juncture. Next day at the Convention Saint-Just could not obtain a hearing. Tallien, Billaud-Varennes, and Vadier vehemently attacked Robespierre, and the voice of the dictator himself was drowned with cries of "Down with the tyrant." Turning to the Right, "I appeal

to you whose hands are clean," he cried, but the Right sat in stony silence. "President of Assassins, I demand to be heard," he cried, but his voice died down in his throat. "The blood of Danton chokes him," cried Garnier. An unknown deputy named Louchet proposed that Robespierre should be arrested, and at the fatal words his power crumbled into ruins. His younger brother and Lebas demanded to be included in the honorable sentence. Vain attempts were made by the Jacobin Club and the Commune to save their hero, but Paris refused to move, and even Henriot's artillerymen to obey. Robespierre broke his arrest and flew to the City Hall, whereupon the Convention at once declared him out of the law. The National Guard under Barras turned out to protect the Convention, and Robespierre had his lower jaw broken by a shot fired by a gendarme named Méda. Next day (July 28; 10th Thermidor, 1794) he died, with Saint-Just, Couthon, and 19 others by the guillotine.

ROBIN, AMERICAN, or **MIGRATING THRUSH,** the *Turdus migratorius;* specific character dark-ash color; beneath, brownish-red; head and tail black; the two exterior feathers of the latter white at the inner tip. The robin is found in summer throughout North America from Alaska to Mexico. They retire from higher latitudes only as their food begins to fail, or till driven S. by inundating snows. During the winter months they are numerous in the Southern States. Even as far N. as Boston robins are sometimes seen in the depth of winter. Toward the close of January the robin is still in South Carolina, and about the second week of March begins to appear in the Middle States. By the 10th of March they may also be heard in New England. The eggs, about five, are of a bluish-green, and without spots. They raise several broods in a season.

ROBIN GOODFELLOW, the same as PUCK.

ROBIN HOOD, the hero of a group of old English ballads, represented as an outlaw and a robber, but of a gallant and generous nature, whose familiar haunts are the forests of Sherwood and Barnsdale, where he fleets the time carelessly in the merry greenwood. He is ever genial and good-natured, religious, respectful to the Virgin and to all women for her sake, with a kind of gracious and noble dignity in his bearing. He lives by the king's deer, though personally most loyal, and wages ceaseless warfare on all proud bishops, abbots, and knights, taking of their superfluity, and giving liberally to the poor and to all honest men in distress, of whatever degree. He is unrivalled with the bow and quarter-staff; but in as many as eight of the extant ballads comes off the worse in the combat with some stout fellow, whom he thereupon induces to join his company. His chief comrades are Little John, Scathlok (Scarlet), and Much; to these the "Gest" adds Gilbert of the White Hand and Reynold. A stalwart curtal friar, called Friar Tuck in the title though not in the ballad, fights with Robin Hood, and apparently accepts the invitation to join his company, as he appears later in two broadsides which also mention Maid Marion. Such is the romantic figure of the greatest of English popular heroes—a kind of yeoman counterpart to the knightly Arthur.

The earliest notice of Robin Hood yet found is that pointed out by Percy in "Piers Plowman," which, according to Skeat, cannot be older than about 1377. In the next century we find him mentioned in Wyntoun's "Chronicle of Scotland" (1420). Bower, in his "Scotichronicon" (1441-1447), describes the lower orders of his time as entertaining themselves with ballads both merry and serious about Robin Hood, Little John, and their mates, and preferring them to all others; and Major or Mair (1470-1550) says in his "Historia Maioris Britanniæ" that Robin Hood ballads were sung all over Britain. The last passage gives apparently the earliest mention of those more romantic and redeeming features of Robin Hood which earned him a place in Fuller's "Worthies of England."

Fragments of two Robin Hood plays exist, one dating from 1475, the other printed by Copland with the "Gest" about 1550. The latter is described in the title as "very proper to be played in May-games." Robin Hood was a popular figure in these during the 16th century, as we find from Stow, Hall, and other writers, and there is evidence that in this connection he was known as far N. as Aberdeen.

ROBINS, ELIZABETH (MRS. GEORGE RICHMOND PARKES), an American actress and writer, born in Louisville, Ky. She was educated in Zanesville, Ohio, but the larger part of her life was spent in England. She attained success on the stage in the interpretation of Ibsen's plays. She was best known, however, as a novelist. Her books include "Below the Salt" (1896); "The Open Question" (1898); "The Magnetic North" (1904); "The Convert" (1907); "My Little Sister" 1912; "Way Stations" (1913). She lectured widely on the woman suffrage movement.

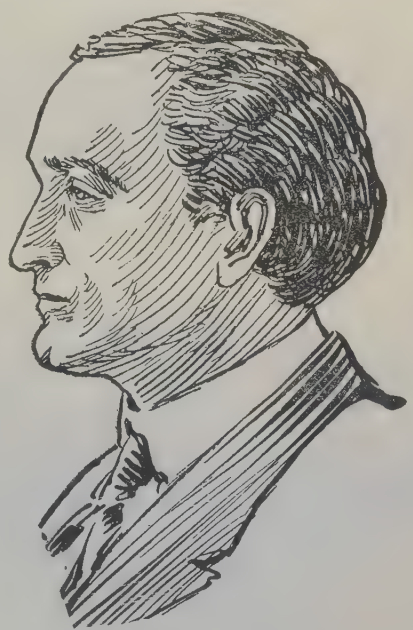
ROBINS, RAYMOND, an American economist and writer, born on Staten Island, N. Y., in 1873. He was educated privately and studied law at George Washington University. He was engaged for several years in social work in Chicago and was a member of the Chicago Board of Education, from 1906 to 1909. He served also as social service expert for the Men and Religion Forward Movement, in 1911-12. He became identified with the Progressive party and served as chairman of the State Central Committee. In 1914 he was candidate for that party, and was temporary and permanent chairman of the Progressive National Convention in 1916. During the World War he was engaged in Y. M. C. A. work and Red Cross work in France. In 1917 he headed the expedition for the American Red Cross to Russia. On his return to the United States he presented an elaborate report on conditions in Russia, which occasioned much discussion on account of its alleged leaning toward the Soviet movement.

ROBINSON, EDWARD, an American writer and authority on art, born in Boston in 1858. He graduated from Harvard in 1879, and spent the following five years in study, especially in Greece and in Berlin, devoting his attention chiefly to archæology. From 1895 to 1902 he was curator of classical antiquities in the Boston Museum of Fine Arts, and was for three years following the latter date director of the museum. He became assistant director of the Metropolitan Museum of Art in New York, succeeding Sir Caspar Purdon Clarke as director in 1910. He prepared catalogues and contributed many articles on art and archæological subjects for magazines. He was a member of many learned societies.

ROBINSON, EDWIN ARLINGTON, an American author and poet, born at Head Tide, Me., in 1869. He studied at Harvard University and became a member of the National Institute of Arts and Letters through the general recognition of intellectual sincerity and positive American spirit and theme that appeared alike in his plays and published poems. His first publication was "The Torrent of the Night Before," brought out in 1896. Since then he has published "The Children of the Night"; "Captain Craig"; "Van Zorn," a play, and "The Man against the Sky," and "Merlin," both poems.

ROBINSON, JAMES HARVEY, an American writer and lecturer, born in Bloomington, Ill., in 1863. He graduated from Harvard University in 1887 and took post-graduate studies in Germany. He was lecturer on European history at the University of Pennsylvania in 1891, and from 1892 to 1919 he was associate professor and professor of history at Columbia University. From 1919 he acted as organizer and lecturer of the New School for Social Research. He was the editor of the Annals of the American Academy of Political and Social Science, and an associate editor of the "American Historical Review." His historical writings include "Readings in European History" (1904-5); "The Development of Modern Europe" (1907); "The New History" (1911); and "Mediæval and Modern Times" (1915).

ROBINSON, JOSEPH TAYLOR, an American lawyer and legislator. He was born at Lonoke, Ark., in 1872, and was educated in the public schools and the University of Arkansas. He studied law and was admitted to the bar in 1895, beginning to practice at Lonoke. In 1895 he became a member of the General Assembly and in 1896 was nominated presidential elector on the Democratic ticket, but retired at the request of the Democratic National Committee in the interest of fusion to make room for Populists. He was presidential elector in 1900 and electoral messenger in 1901. He represented the sixth Arkansas district in Congress 1903-13, resigning in the last year, to be inaugurated as Governor of Arkan-



JOSEPH TAYLOR ROBINSON

sas, to which he had been elected in 1912. He was elected to the United States Senate in 1913 to succeed the Hon. Jeff Davis and was re-elected in 1918.

ROBINSON, WILLIAM JOSEPHUS, an American physician and writer, born at Mount Morris, New York, in 1869. He graduated from the Columbia University College of Pharmacy and from the medical college of New York University, doing post-graduate work at the University of Berlin and Vienna. He was a lecturer on chemistry, pharmacology and materia medica of the Board of Pharmacy Institute, New York, and president of the medical board and chief of the Genito-Urinary and Dermatological departments of the Bronx Hospital and Dispensary. He was also a Fellow of the New York Academy of Medicine, and a member of various domestic and foreign medical societies. Besides being a founder and editor of the "Critic and Guide," and an editor of the "American Journal of Urology," he wrote: "Never Told Tales" (1908); "Sexual Problems of To-day" (1912); "Practical Eugenics" (1912); "Sex Morality" (1912); "Eugenics and Marriage" (1917).

ROBINSON CRUSOE. Alexander Selkirk was found in the desert island of Juan Fernandez (1709), where he had been left by Captain Stradling. He had been on the island four years and four months, when he was rescued by Captain Rogers. See SELKIRK.

ROB ROY (Gaelic, "Red Robert"), the Scotch Robin Hood; born in 1671; second son of Lieut.-Col. Donald Macgregor of Glengyle. Till 1661 the "wicked clan Gregor" had for more than a century been constantly pursued with fire and sword; the very name was proscribed. But from that year till the Revolution the severe laws against them were somewhat relaxed; and Rob Roy, who married a kinswoman, Mary Macgregor, lived quietly enough as a grazier on the Braes of Balquhidder. His herds were so often plundered by "broken men" from the N. that he had to maintain a band of armed followers to protect both himself and such of his neighbors as paid him blackmail. And so with those followers, espousing in 1691 the Jacobite cause, he did a little plundering for himself, and, two or three years later having purchased from his nephew the lands of Craigroyston and Inversnaid, laid claim thenceforth to the chief of the clan.

In consequence of losses incurred about 1712 in unsuccessful speculations in cattle, for which he had borrowed money from the Duke of Montrose, his lands were seized, his houses plundered, and his wife shamefully used, turned adrift with his children in midwinter. Maddened by these misfortunes, Rob Roy gathered his clansmen and made open war on the duke, sweeping away the whole cattle of a district, and kidnaping his factor with rents to the value of more than $15,000. This was in 1716, the year after the Jacobite rebellion, in which at Sheriffmuir Rob Roy had "stood watch" for the booty, and had been sent by the Earl of Mar to raise some of the clan Gregor at Aberdeen. Marvelous stories are current round Lock Katrine and Loch Lomond of his hair-breadth escapes from capture, of his evasions when captured, and of his generosity to the poor, whose wants he supplied at the expense of the rich. Rob Roy enjoyed the protection of the Duke of Argyll, having assumed the name Campbell, his mother's. Late in life he is said to have turned Catholic, but he remained a Protestant. He died in his own house at Balquhidder Dec. 28, 1734. He left five sons, two of whom died in 1734—James, an outlaw, in Paris; and Robin, the youngest, on the gallows at Edinburgh for abduction.

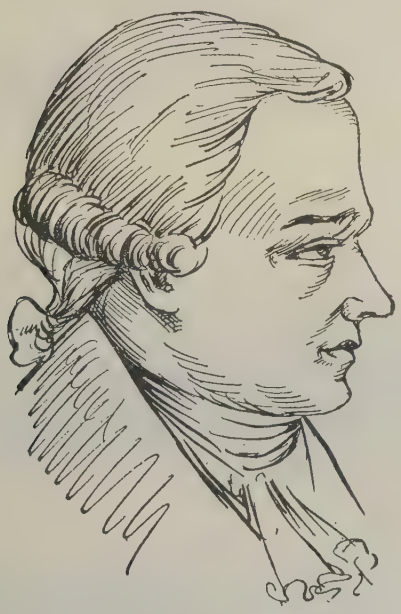
ROBSON, MAY, an American actress, born in Australia. She was educated at Brussels and at Paris, and came to the United States in 1879. Her first appearance on the stage was as "Tilly," in "The Hoop of Gold," at Brooklyn in 1884. From 1886 to 1893 she played under the management of Daniel Frohman at the Madison Square and Lyceum Theaters, New York, and from 1893 to 1906 under the management of Charles Frohman. Her first appearance as a "star" occurred in 1907 at Scranton, Pa., in "The Rejuvenation of Aunt Mary," in which play she appeared in London in 1910. Since then she has appeared in many stellar rôles with great success, both in this country and in England. She wrote, together with C. T. Dazey, "A Night Out" (1911).

ROC, or **RUKH,** a fabulous bird of immense size, able to carry off an elephant in its talons. The idea is familiar in the East, and every reader will remember it in the "Arabian Nights' Entertainments." Mythical birds of similar size and strength were the Arabian *anka* and the Persian *simurgh*. The *amru* or *sinamru* was an older Persian supernatural bird; the Indian *garuda*, which bears Vishnu, is the king of birds.

ROCAMBOLE, in botany, (1) *Allium scorodoprasum*, a plant with bulbs like garlic, but with the cloves smaller. It is used for the same purposes as the shallot, garlic, etc. A native of Denmark. (2) *Allium ophioscorodon*, from

Greece. Sometimes the two are considered to be identical.

ROCHAMBEAU (rō-sha*ng*-bō) **JEAN BAPTISTE DONATIEN DE VIMEUR, COUNT DE,** a Marshal of France; born in Vendôme, France, July 1, 1725, entered the French army in 1742, distinguished himself in the Seven Years' War,



COUNT DE ROCHAMBEAU

and became Marshal in 1791. In 1780-1782 he commanded the French forces sent to aid the revolted British colonists in America. He became governor of Artois and Picardy, and subsequently of Alsace, and commanded the Army of the North in 1792. During the Reign of Terror he narrowly escaped the guillotine. He died in Thoré, May 10, 1807.

ROCHDALE, a borough of England; in Lancashire, 10 miles N. N. E. of Manchester. It is a place of considerable antiquity, and was early noted for its woolen manufactures, which have remained a chief staple till the present day. Cotton is extensively manufactured, and there are also foundries, machine shops, etc.; while in the neighborhood are quarries of freestone and extensive collieries. The parish church (St. Chad), of the 12th century, situated on an eminence, is approached from the lower part of the town by a flight of 122 steps. The town hall is a fine modern building, and there is a handsome free library. Rochdale is the center of the co-operative movement, which originated there in 1844. By means of canals it has a water communication with all the industrial centers of the N. of England. Pop. (1919) 93,806.

ROCHE, ARTHUR SOMERS, an American author, born in Somerville, Mass., in 1883. He was educated at Holy Cross College and at Boston University. After practicing law he entered newspaper work in 1906. Beginning with 1910, he contributed short stories to many of the leading magazines. He also wrote "Loot" (1916); "Plunder" (1917); "The Sport of Kings" (1917).

ROCHE, JAMES JEFFREY, an American author; born in Queen's co., Ireland, May 31, 1847. He went to Boston in 1866 and became in 1890 an editor of the "Pilot," and published: "Songs and Satires" (1886); "Ballads of Blue Water," "Life of John Boyle O'Reilly," "Her Majesty the King," etc. He died in 1908.

ROCHE, REGINA MARIA, an Irish novelist; born about 1764 in the S. of Ireland. She sprang into fame on the appearance of the novel "The Children of the Abbey" (1798). From that time till her death she produced many books of the same character, including: "The Nocturnal Visit" (1800); "The Tradition of the Castle" (1824); "The Castle Chapel" (1825); "The Nun's Picture" (1834), and many others. She died in Waterford, May 17, 1845.

ROCHE-SUR-YON, LA, France, formerly Napoleon Vendée, and Bourbon Vendée, capital of the Department of La Vendée, situated on the right bank of the Yon, 40 miles S. of Nantes. The town was founded during the Napoleonic régime, near the old castle of Roche-sur-Yon, from which it derived its name after the downfall of Napoleon. It is noted for its woolen mills and its production of hardware. Pop. about 15,000.

ROCHEFORT, VICTOR HENRI, a French journalist; born in Paris, France, Jan. 30, 1830. He was removed from the editorship of "Figaro" because of his satires on the imperial government; and the papers which he himself founded —"The Lanterne," "The Marseillaise," "The Password"—were filled with the same violent attacks. Condemned to exile in New Caledonia for his share in the Paris Commune, he escaped and afterward resided in England until amnestied. In England and later in Paris he edited a daily paper, "The Irreconcilable," noted for his vitriolic articles against the French Government. He wrote farces, vaudeville, comic romances, and political

works. Among them: "The Depraved Ones" (1882); "Return from Nova Scotia" (1877); "Mlle. Bismarck" (1880); "Bitter Farces" (1886); "The [political] Lanterns of the Empire" (1884); "Fantasia" (1888); "Adventures of My Life" (1896). He died July 1, 1913.

ROCHEFORT-SUR-MER, a French seaport, naval arsenal, and fortress of the first class, in the department of Charente-Inférieure; on the right bank of the Charente, 9 miles from its mouth, and 18 miles S. S. E. of Rochelle, 89 S. W. of Poitiers. It was founded in 1665 as a naval station by Colbert, Louis XIV.'s minister, and fortified by Vauban, being covered now on the sea side by strong forts; and it is a modern, clean, well-built place. It contains important public works. The most celebrated of these is the naval hospital (1783–1788). There are both a naval harbor, and, higher up the river, a commercial harbor with three basins; Rochefort besides possesses rope walks, cannon foundries, and other establishments for the manufacture and preservation of naval stores and marine apparatus of every kind. From 1777 till 1852 it was the seat of a great convict prison. Napoleon meant to take ship for the United States at Rochefort, but instead had to surrender to Captain Maitland of the "Bellerophon," July 15, 1815. During the World War Rochefort became an important military center. Pop. (1911) 35,019.

ROCHEFOUCAULD, FRANÇOIS, DUC DE LA, Prince de Marcillac, a French author; born in Paris, France, Sept. 15, 1613. His celebrity is due to his small volume of "Reflections, or Moral Sentences and Maxims," commonly known as the "Maxims" (first ed. 1665; final edition of the author, 1678, comprising 504 maxims). The dominant note of the "Maxims" is egoism. His "Memoirs" (1662) are equal to the most celebrated memoirs of the time. He died in Paris, March 17, 1680.

ROCHELLE (rō-shĕll'), **LA,** a fortified town and seaport in France, capital of the department of Charente-Inférieure, on the Atlantic, 120 miles N. by W. of Bordeaux. The chief buildings are the cathedral, town hall, exchange, courts of justice, hospital, arsenal, and a public library. The harbor is easily accessible and commodious. The roadstead is protected by the islands of Ré and Oléron. La Rochelle has an extensive trade in wines, brandies, and colonial produce. In the religious wars it was long a Protestant stronghold. It stood an eight months' siege in 1572, but was forced to surrender by famine after a year's siege in 1628. Pop. about 36,000.

ROCHELLE SALT, the popular name of the bitartrate of soda and potash ($KNaC_4H_4O_6 + 4H_2O$), this salt having been discovered in 1672 by a Rochelle apothecary named Seignette. It occurs, when pure, in colorless transparent prisms, generally eight-sided; and in taste it resembles common salt. It is prepared by neutralizing cream of tartar (bitartrate of potash) with carbonate of soda. After a neutral solution has been obtained, it is boiled and filtered, and the resulting fluid is concentrated till a pellicle forms on the surface, when it is set aside to crystallize. This salt is a mild and efficient laxative, and is less disagreeable to the taste than most of the saline purgatives.

ROCHES MOUTONNÉES, smooth, rounded hummocky bosses and undulating surfaces of rock, of common occurrence in regions which have been overflowed by glacier ice. The name is that used by the Swiss peasants—the bare rounded rocks of a valley bottom when seen from above having a fanciful resemblance to a flock of sheep lying down.

ROCHESTER, a city and county-seat of Olmsted co., Minn.; on the Zumbro river, and on the Chicago and Northwestern and the Chicago Great Western railroads; 90 miles S. E. of St. Paul. Here are a public high school, State Hospital for the Insane, St. Mary's Hospital, a Roman Catholic Seminary, National banks, and several daily and weekly newspapers. The city was the home of the Mayo brothers (*q. v.*), surgeons, who conducted and endowed St. Mary's Hospital. It has a number of foundries, and manufactories of wagons, furniture, and agricultural implements. The city was incorporated in 1858. Pop. (1910) 7,844; (1920) 13,722.

ROCHESTER, a city of New Hampshire, in Strafford co. It is on the Cocheco river and on the Boston and Maine railroad. It has important industries including the manufacture of shoes, woolen goods, brick, leather goods, and lumber. It has excellent schools and a public library. Pop. (1910) 8,868; (1920) 9,673.

ROCHESTER, a city of New York, the county-seat of Monroe co. It is on Lake Ontario, the Barge canal, and on the New York Central, the Erie, the Lehigh Valley, the Pennsylvania, and the Buffalo, Rochester and Pittsburgh railroads.

There are five electric lines carrying passengers, express and freight into the city. The recently completed barge canal is an outlet for heavy freight, and has a harbor in the center of the city.

The city school system includes 47 buildings. In 1919 there were approximately 1,400 teachers with 42,876 registered pupils. The expenditures of the Board for 1919 were $2,927,933.43. There are 5 high schools, 32 parochial schools and many private institutions, including 4 academies, two for girls and two for boys, and one large institution for instruction of deaf mutes. The University of Rochester was founded in 1850 and has beautiful grounds in the eastern part of the city. There are also the Rochester Theological Seminary, Baptist, and St. Bernard's Theological Seminary, Catholic.

There are 16 banks in Rochester with a capital of $6,500,000, a total surplus of $15,916,000, and total deposits of $227,726,044.

The city owns its own waterworks system, bringing its supply from Hemlock and Canadice lakes, 30 miles S. of Rochester, through three large conduits. There are 5 daily newspapers, and a large number appearing less frequently.

The city maintains a large park system. The Park Commission was created in 1888 and the park system has been enlarged year by year through purchases and gifts so that now the total area of park territory is 16,049 acres. The five largest parks in their order are Durand-Eastman, located on the lake shore and the northern edge of the city; Genesee Valley Park, located on the S. of the city on both sides of the Genesee river; Seneca Park, to the N. of the city and E. of the river; Maplewood Park, to the N. of the city and W. of the river; Highland Park, in which is located one of the large reservoirs; also one of the finest arboretums in the country.

Rochester has a public library with 6 branches circulating 75,000 volumes. The city also has the Reynolds Library with 78,000 volumes. These are in addition to the libraries maintained by the school system and universities.

The manufacturing interests of Rochester are large. There are 1,760 factories turning out 350 commodities. The city leads the world in the production of a large number of articles, including cameras, camera supplies, optical goods, check protectors, thermometers, filing devices and office systems, enameled steel tanks, soda fountain fruits and syrups. The city leads in the country in the production of high-class ivory buttons and is the headquarters for all nursery business in the United States. It produces 60% of the typewriter and carbon ribbon made in the country. It ranks fourth in the United States in the production of shoes and men's clothing. The annual output of shoes in 1919 was $55,000,000 in the 56 factories of Rochester. The annual output of high-grade men's clothing in 1919 was $60,000,000 in 40 factories. The value of the annual woodworking output is $14,000,000. It is a large machinery center, having several large plants devoted to the manufacture of machines and tools. There are also several automobile factories.

History.—The site of the city was occupied by a few colonists as early as 1788, but the first permanent settlement was made by Nathaniel Rochester in 1810. The first frame house was built in 1812, and the place was incorporated under the name of Rochesterville in 1817. It received its city charter in 1834. Pop. (1890) 133,896; (1900) 162,608; (1910) 218,159; (1920) 295,750.

ROCHESTER, a borough of Pennsylvania, in Beaver co. It is on the Ohio river and on the railroads of the Pennsylvania system. It is the center of an important industrial region and in the vicinity are deposits of gas, oil, clay and building stone. Its manufactures include glass, structural steel, pottery, stoves, lumber products, etc. Pop. (1910) 5,903; (1920) 6,957.

ROCHESTER, a city of Kent, England, 33 miles E. S. E. of London; chiefly on the right bank of the Medway, contiguous to Chatham, and joined to Strood by an iron swing bridge constructed in 1850–1856 at a cost of $850,000. The castle or keep, which crowns a steep eminence near the bridge, was the work of Archbishop William de Corbeuil (1126); but the wall overlooking the river contains Norman masonry of earlier date, built upon Roman foundations. It is 104 feet high and 70 feet square, with walls 12 feet thick, and is a very fine specimen of Norman architecture; it was taken by John (1215, the S. E. corner being rebuilt shortly afterward), vainly attacked by De Montfort (1264), and taken again by Tyler (1381). Both castle and grounds were purchased in 1883 by the corporation from the Earl of Jersey. The Episcopal see was founded in 604 by St. Augustine, and the foundations of the cathedral then built have been discovered. Bishop Gundulf (1077–1107) built a new cathedral, of which part of the crypt remains. This cathedral was rebuilt by Ernulf and John of Canterbury (1115–1137), whose nave remains; and the choir was again

rebuilt and enlarged in the 13th century in part out of offerings of pilgrims at the shrine of St. William of Perth, a Scotch baker, who, on a pilgrimage to the Holy Land, was murdered near Rochester by his companion and adopted son; the tower rebuilt by Cottingham (1825-1827), the choir and transepts restored by Scott (1871–1877), and the W. front being restored by Pearson in 1891. It measures 306 feet in length, and has double transepts; and special features of interest are the Norman west doorway and nave, the Early English choir, of singular plan and early character, the spacious crypt, and a fine decorated doorway leading to the modern library. The ruins of an early Norman keep or residence built by Gundulf, the architect of the Tower of London, stand on the N. side of the choir. St. Bartholomew's Hospital, founded by Gundulf in 1078 for lepers, was refounded in 1863; the Norman chapel remains. Watts' Charity House, founded in 1579 to lodge "six poor travelers, not being rogues or proctors," has been immortalized by Dickens, whose home, Gadshill, is 3 miles distant, and who introduces Rochester into "Pickwick," "Edwin Drood," and others of his novels. Three schools are the cathedral grammar school (Henry VIII.), Williamson's mathematical school (1704; reopened under a new scheme, 1880), and a grammar school for girls (1888); and other buildings are Satis House, Restoration House (Charles II. slept here in 1660), the guild hall (1687), and the corn exchange (1871). Rochester—the Roman station Durobrivæ and Anglo-Saxon Hrofe-ceastre—was made a municipal borough by Henry II. James II. embarked here in his flight (1688). Pop. about 32,000.

ROCHESTER, JOHN WILMOT, EARL OF, a witty English nobleman of the court of Charles II.; born in Ditchley, Oxfordshire, April 10, 1647, and was educated at Wadham College. He succeeded to the title and estates in 1659. He served in the fleet under Lord Sandwich, and distinguished himself at the attack on Bergen. On his return to England he became the personal friend and favorite of the king. His constitution gave way under his habits of drunkenness and debauchery. His poetical works consist of satires, love songs, and drinking songs, many of them gems of wit and fancy, and many of them daringly immoral. He died July 26, 1680.

ROCHESTER, UNIVERSITY OF, a co-educational institution in Rochester, N. Y.; founded in 1850 under the auspices of the Baptist Church; reported at the close of 1919: Professors and instructors, 51; students, 677; president, Rush Rhees, LL.D.

ROCK, any portion of the earth's crust, coherent or incoherent, any sedimentary stratum or any dyke or overlying mass of volcanic or plutonic mineral matter. The older writers drew a distinction between rocks and soils. Both are now regarded as rocks. Most rocks, originally soft, have become hard and compact by losing their moisture and being subjected to pressure. As a rule, a rock is not a bed of some simple mineral. In most cases there are crystals cemented together by imperfectly crystalline or amorphous matter, or there is a mixture of angular and rounded grains, also bound together by mineral matter. See MINERALOGY. Viewed as to composition, there are three leading classes of rock: Siliceous or arenaceous, some formed of loose sand, others of hard sandstone, with all intermediate grades; argillaceous rocks, *i. e.*, rocks of clay, or more specifically having one-fourth alumina to three-fourths silica; and calcareous rocks composed chiefly of carbonate of lime, some of them proved and most of the others suspected, to be originally composed of various organisms. Viewed as to their origin, Lyell long recognized four kinds of rocks. Aqueous or sedimentary, volcanic, metamorphic, and plutonic. A fifth category has now been superadded, viz., aërial or æolian, formed by the action of wind. Aqueous, æolian, and metamorphic rocks are, as a rule, stratified; volcanic and plutonic rocks generally unstratified; the last two are called igneous. Some stratified rocks are unfossiliferous, others fossiliferous. For the stratigraphical or chronological order of the latter, see FOSSILS. See GEOLOGY.

ROCK COD, a cod caught on a rocky sea bottom. They are considered to be of better flavor than fish from a sandy bottom.

ROCK CRYSTAL. See QUARTZ.

ROCKEFELLER, JOHN DAVISON, an American capitalist; born in Richford, Tioga co., N. Y., July 8, 1839. He engaged in business when he was 16, and soon showed ability in detail and discretion in management. When discoveries of petroleum roused speculative interest in 1860, he owned a refinery in Cleveland, O. In 1870 he became president of the Standard Oil Company, a monopolistic corporation, and through which he accumulated immense wealth. He made large donations to educational

institutions, notably to the University of Chicago, to which he has given in all

JOHN D. ROCKEFELLER, SR.

about $23,000,000. In 1902 he founded the General Education Board (*q. v.*) to promote higher education, and later established the Rockefeller Foundation (*q. v.*) and the Rockefeller Institute for Medical Research (*q. v.*) In November, 1920, he founded the Laura Spellman Foundation, in memory of his wife, with an endowment of $65,000,000.

ROCKEFELLER, JOHN DAVISON, JR., an American capitalist. He was born in Cleveland, O., in 1874, the son of a father generally recognized later as the richest man in the world. He studied privately and at Brown University, from which he graduated in 1897. He then became associated with his father in his business enterprises and took particular charge of the philanthropic activities associated with his name. He became a director of the Colorado Fuel & Iron Co., American Linseed Co., and Merchants Fire Insurance Corporation. He is a member of the Rockefeller Foundation, the General Education Board, the Rockefeller Institute for Medical Research, the Bureau of Social Hygiene, and the International Health Commission. During the war he made large donations for the relief of suffering.

ROCKEFELLER, WILLIAM, an American capitalist, brother of John D. Rockefeller, born at Richford, N. Y., in 1841. He joined his brother in the oil refining business in Cleveland and from 1865 to 1911 was in charge of the New York business of the Standard Oil Company of New Jersey, and was at the same time president of the Standard Oil Company of New York. He was a director of many important banks, railroads, mining corporations, etc.

ROCKEFELLER FOUNDATION, a trust, incorporated by the Act of the New York Legislature of May 14, 1913, "to promote the well-being of mankind throughout the world." The Foundation has devoted its resources primarily to the improvement of public health and medical education throughout the world. This purpose is accomplished by three subsidiary departments, the International Health Board, the China Medical Board, and the Division of Medical Education. The Foundation also uses other organizations already existing and not affiliated with the Foundation, to which appropriations are made by the Foundation. The management of the Foundation, under the terms of the charter, is in the hands of a self-perpetuating body of trustees. The executive officers of the Foundation in 1920 were George E. Vincent, president, and Edwin R. Embree, secretary. John D. Rockefeller, Jr., was chairman of the Board of Trustees. At the end of 1919 the total resources in securities were reported as $170,000,000, both the income and principal of which are available for appropriations. In June, 1920, the trustees of the Foundation, in conjunction with the General Education Board (*q. v.*), announced their appropriation of over $20,000,000 for the development of medical schools and for the purpose of general education. Among the most important work undertaken by the Foundation was a world-wide campaign against the hookworm disease; the work of the China Medical Board for the promotion of public health and medical education in China; the creation of an Industrial Relations Investigation Division; and extensive appropriations for war relief work in co-operation with the Commission for Relief in Belgium, and with the Red Cross Society. Appropriations have also been made from time to time to the American Academy at Rome, to various philanthropic societies in New

York City and New York State, to the National Organization for Public Health Nursing, to the National Committee for Mental Hygiene, and to many other in-

JOHN D. ROCKEFELLER, JR.

stitutions and societies. In 1920 the Rockefeller Foundation gave $6,000,000 to the London (England) University College and Medical School, for teaching and research.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, an institution founded by John D. Rockefeller in 1901 and incorporated under the laws of the State of New York for the purpose of encouraging "medical research with special reference to prevention and treatment of disease." The original charter was amended in 1908, and the scope of the work was enlarged. The headquarters of the Institute are located at Sixty-sixth street and the East river, New York City. The three principal departments are laboratories for pathology, bacteriology, chemistry, pharmacology, physiology, experimental surgery, and experimental biology; a hospital for the study of special problems; and a special home for the care of animals, with a farm and laboratory near Princeton, N. J. The Institute publishes "The Journal of Experimental Medicine," "The Journal of General Physiology," "The Journal of Biological Chemistry," "Studies from the Rockefeller Institute of Medical Research," and a series of monographs. The total endowment at the end of 1919 was $27,000,000. During the World War the entire staff and equipment were devoted to war service, especially for the treatment of wounds and diseases most frequent among soldiers. With the end of the war, the Institute returned to its original field of research. The scientific staff includes members of the Institute, associate members, associates, assistants, fellows, and research scholars. Dr. Simon Flexner was director of the Institute and of its laboratories.

ROCKET, a cylindrical case of pasteboard or metal, attached to one extremity of a light wooden rod, and containing a composition which, being fired, shoots the whole of the arrangement through the air, by that principle that an unbalanced reaction from the heated gases which issue from openings in fireworks gives them motion in the opposite direction. As signals between persons who were unable to communicate with each other on account of darkness or some other cause, rockets have long been employed. They were also used for the important service of determining the difference of longitude between two places.

The force by which a rocket ascends is similar to that by which a gun recoils when it is fired. The rod serves to guide the rocket in its flight, the common center of gravity of the rocket and rod being a little below the top of the latter. The distance at which signal rockets can be seen varies between 35 and 40 miles; and the times of ascent from 7 to 10 seconds. At the beginning of the 19th century Sir William Congreve converted the rocket into a terrible projectile of war, with ranges which no ordnance of that day could attain. Discarding the small sizes, he made 12, 18 and 32-pound rockets which he charged with canister-shot, bullets, and other missiles. The stick for a 32-pound rocket is 18 feet in length, and the maximum range 3,500 yards. The range can be also increased by discharging the rocket from a cannon, with a time fuse to ignite it at the cannon's utmost range, when the rocket commences its own course. The Congreve rockets were first tried in actual service, and with fatal effect, at the attack on Copenhagen in 1807. A rocket is also a piece of wood employed to blunt the end of a lance in a tourney, to prevent it from doing hurt.

In the World War rockets were used by the different combatants as signals, but more often bombs discharging colored lights.

ROCKFORD, a city and county-seat of Winnebago co., Ill.; on the Rock river, and on the Illinois Central, the Chicago, Milwaukee, and St. Paul, the Burlington Route, the Chicago, Milwaukee and Gary, and the Chicago and Northwestern railroads; 85 miles W. of Chicago. Here are a United States Government building, Rockford College, high school, business college, waterworks, electric lights, hospitals, sanitariums, public library, several National banks, and a number of daily and weekly periodicals. The city has extensive manufacturing interests, including large reaper factories, paper mills, flour mills, cotton and furniture factories, woolen mills, a large watch factory, and over 200 smaller factories. Pop. (1910) 45,401; (1920) 65,651.

ROCKFORD COLLEGE, an institution for the higher education of women, founded at Rockford, Ill., in 1849. In 1919 there were 194 students and 30 instructors. President, W. A. Maddox, Ph.D.

ROCKHAMPTON, a city of Queensland, Australia, situated on the Fitzroy river, 397 miles N. W. of Brisbane. It is centrally situated and is the commercial center of the province, forming the port to the Mount Morgan gold workings. It has several notable buildings and open places, with botanical gardens and a bridge 1,160 feet long spanning the river. The industries are varied, the chief having relation to the frozen meat trade. Pop. (1919) 20,915.

ROCK HILL, a city of South Carolina, in York co. It is on the Southern railroad. It is the center of an important cotton growing and agricultural region and its industries include cotton mills, wagon factories, a fertilizer factory, brick works, foundry and machine shops. It has power developed from the power plant on the Catawba and Broad rivers. It is the seat of the Winthrop Normal and Industrial College of South Carolina, and has a public library and a hospital. Pop. (1910) 7,216; (1920) 8,809.

ROCKHILL, WILLIAM WOODVILLE, an American diplomatist; born in Philadelphia, Pa., in 1854; entered the diplomatic service in 1884 as second secretary of legation at Peking, China; was chargé d'affaires at Seoul, Korea, in 1886-1887; was appointed chief clerk of the State Department in 1893; was made third assistant secretary of State a year later; and first assistant in 1896. He was appointed director of the Bureau of American Republics in May, 1899. After the rescue of the foreign diplomats in Peking in 1900, and United States Minister Conger was granted leave of absence, Mr. Rockhill was appointed a special ambassador to conclude peace negotiations. He was minister to China until 1905. Minister to Russia 1909, and to Turkey 1911-1913. He wrote "A Journey to the Eastern Parts of the World" (1903); "Treaties and Conquest; China and Korea" (1904); "Chau Ju-Kua" (1911). He died in 1914.

ROCKING STONES, or LOGANS, large masses of rock so finely poised as to move backward and forward with the slightest impulse. They occur in nearly every country. Some of them appear to be natural, others artificial; the latter seem to have been formed by cutting away a mass of rock round the centerpoint of its base.

ROCK ISLAND, a city in Rock Island co., Ill.; on the Mississippi river, and on the Burlington Route, the Chicago, Milwaukee and St. Paul, Chicago, Burlington and Quincy, the Davenport, Rock Island and Northwestern, the Rock Island Southern, and the Chicago, Rock Island and Pacific railroads; 80 miles N. W. of Peoria. Here the Mississippi is spanned by a railroad bridge which cost $1,300,000. The city derives its name from a beautiful island in the river, which belongs to the United States, and is used by the Federal government for a great central arsenal, a large armory and foundry. A dam across the river furnishes abundant water power. Before and during the Black Hawk War there were block-house forts on this island, and during the Civil War the prison here was the place of detention of many Confederate prisoners. The city contains waterworks, street railroad and electric light plants, Augustana College and Theological Seminary (Luth.), National and State banks, and daily and weekly newspapers. It has lumber mills, foundries, machine shops, manufactories of farming implements, soap, glass, stoves, etc. Pop. (1910) 24,335; (1920) 35,177.

ROCKLAND, a city and county-seat of Knox co., Me.; on the W. shore of Penobscot Bay, 10 miles from the Atlantic ocean, and on the Maine Central railroad; 40 miles S. E. of Augusta. The harbor here is large and has been greatly improved by the construction of a granite breakwater. There is regular steamboat connection with Boston and other ports. The city contains a United States government building, public library, street railroad and electric light plants, waterworks on the gravity system. National and State

banks, and several daily and weekly newspapers. The manufacture of lime is the principal industry. Near by are extensive quarries of fine granite of which the post-offices of New York and Cincinnati and the custom-house in St. Louis are built. Besides an immense lime industry Rockland has machine shops, foundries, iron and brass works, etc. Pop. (1910) 8,174; (1920) 8,109.

ROCKLAND, a town of Massachusetts, in Plymouth co. It is on the New York, New Haven, and Hartford railroad. Its industries include the manufacture of shoes, nails, etc. There is a public library and other buildings. Pop. (1910) 6,928; (1920) 7,544.

ROCK OF CHICKAMAUGA, a name applied to Gen. George H. Thomas, U. S. A., on account of his heroic stubbornness in holding his position at Chickamauga during the Civil War, in September, 1863. See THOMAS, GEORGE H.

ROCK PIGEON, a pigeon that builds its nest in hollows or crevices of rocks and cliffs, especially the *Columba livia*.

ROCK RIVER, a river of the United States, which rises in Wisconsin, 50 miles W. of Lake Michigan, and falls into the Mississippi 2 miles below Rock Island city; length, 330 miles, about 225 of which have been ascended by small steamboats.

ROCK SALT, common salt, or chloride of sodium, occurring as a mineral and in a solid form. It is always mixed with various impurities. It is found massive or crystallized, its crystals generally cubes, its masses very often either granular or fibrous. It is white, gray, or, owing to the presence of impurities, more rarely red, violet, blue, or striped. For its chemical and other qualities, see SALT. It is a very extensively-diffused mineral, and in some places forms great rock and even mountain masses. A hill of rock-salt near Montserrat, in Spain, is 500 feet high. The island of Ormus, in the Persian Gulf, is formed of rock salt. The Indus, in the upper part of its course, forces its way through hills of rock salt.

ROCK SCORPION (*Buthus* or *Scorpio afer*), a species of scorpion found in Africa, averaging about six inches in length. The bite of this animal, though not absolutely fatal, is yet considered to be dangerous.

ROCK SNAKE, a name sometimes given to any individual of the genus *Python*. Rock snakes are among the largest of living reptiles; specimens of 18 and 20 feet long have been brought to the United States. They kill their prey by constriction, and swallow it whole, commencing with the head.

ROCK SPRINGS, a city of Wyoming, in Sweetwater co. It is on the Union Pacific railroad. In the neighborhood are important coal mines and it is also the center of an important farming and cattle raising region. The notable buildings include a State hospital, government building, public library, city hall, Elks' building and a Masonic Temple. Pop. (1910) 5,778; (1920) 6,456.

ROCKVILLE, a city of Connecticut, in Tolland co. It is on the Hockanum river, and on the New York, New Haven and Hartford railroad. Excellent water power is furnished by the river and the industrial establishments include woolen mills, silk mills, an envelope factory, etc. The city has an excellent school system and a public library. Pop. (1910) 7,977; (1920) 7,726.

ROCKVILLE CENTRE, a village of New York in Nassau co. It is on the Long Island railroad. It is chiefly a residential place but has important oyster fishing interests, and a lace and handkerchief factory. Its public institutions include a public library and a Catholic parochial school. Pop. (1910) 3,667; (1920) 6,262.

ROCKY MOUNT, a city of North Carolina, in Edgecomb and Nash counties, on the Atlantic Coast Line railroad. It is the center of an important cotton and tobacco growing region. Its industries include railroad repair shops, and manufactures of tobacco, wood products, and hosiery. Pop. (1910) 8,051; (1920) 12,742.

ROCKY MOUNTAINS, THE, a chain of mountains in the central and W. portions of the North American continent, are a prolongation of the great Mexican Cordillera, extending from the N. frontier of Mexico N. in several ranges, one of which, the E., passing through British North America, reaches the Arctic ocean in about lat. 70 N.; while the W., passing near the Pacific coast, terminates near Prince William's Sound, in about lat. 60° N. The territory occupied extends from the Californian shores of the Pacific to about lon. 105° W., or it may be considered as extending 125 miles further E., including the Black Hills of South Dakota and Wyoming. The whole area properly included by the mountains and their intervening valleys and desert lands in the country belonging to the United States is estimated at about 980,000 square miles. The mountainous belt of eastern New Mexico and of the State

of Colorado, first met with in crossing the great plains that lie along the headwaters of the rivers which flow S. E. into the Mexican Gulf, and E. toward the Mississippi, has a general N. and S. direction. Santa Fé, N. M., is situated on this belt, and further N. it includes territorially the Spanish peaks. On its E. margin stands Pike's Peak, while in Colorado and Nebraska are those portions of the chain known as the Three Parks, and the Medicine Bow Mountains. From Long's Peak, in about lat. 40°, the range trends N. W., connecting with the Wind River Mountains, which latter includes Frémont's Peak, 13,870 feet above sea-level. Beyond that peak to the N. boundary of the United States the range separates the Dakotas and Washington, and the pass known as Lewis and Clark's, in lat. 47°, is the most northern pass of its system in the Union, and is the one followed by the Northern Pacific railroad. In British North America the "Rockies" divide the waters of the Pacific from those which flow into Hudson Bay, as the Saskatchewan, Athabaska, etc., and also from the Mackenzie river, whose outlet is the Arctic ocean. The next great range of this mountain system toward the W. is that called the Wahsatch Mountains, lying S. from Great Salt Lake, and toward the N. W. this region is traced along the W. bank of the Colorado toward the Sierra Nevada, which forms the E. boundary of California, and the watershed of the Colorado, and Lewis' Fork of the Columbia river, in lat. 37° and 46° respectively. Nearly the whole area between these points, and for a breadth of about 10 degrees of longitude, stretching E. from the Sierra Nevada, is a vast and partially explored territory, from 4,000 to 5,000 feet above sea-level, which receives the streams that fall on the W. slope of the Wahsatch range and on the E. slope of the Sierra Nevada. In British America this section of the chain interlocks with the main trunk of the Rocky Mountains. The W. portion of the chain commences at the S. extremity of the Lower Californian peninsula, then passing through California it bifurcates into two ranges, known, respectively, as the Sierra Nevada, at a distance of about 160 miles from the coast, and the Coast Range, skirting the shores of the Pacific from 10 to 50 miles inland, till it reconnects with the Sierra Nevada in northern California, in which section Mount Shasta attains an altitude of about 14,000 feet above tide water. Throughout all of Oregon and Washington, the distinction is still maintained between the main range (Sierra Nevada), here called the Cascade Mountains, and the Coast Range. The latter traverses the central portion of Vancouver Island for its whole length, and on the mainland in British Columbia the Sierra Nevada proceeds N. and is crossed by the Fraser river. Though the Sierra Nevada in its range between California and Nevada is intersected by no rivers, several of the streams which flow down its E. slopes have their sources high on the summits in the vicinity of those which feed the W. watershed. Several depressions are met with at these points, which serve as passes for the routes from Sonora, Sacramento, and Marysville to the E. By the cañon of Carson river, the range is crossed at an elevation of about 7,250 feet; and by the Truckee Pass the elevation is about 6,000 feet. From these passes the route is N. E. to the main road which crosses the Sierra Nevada in the N. portion of California, and which E. passes by the Humboldt Mountains to Salt Lake City. To the E. of Salt Lake this route continues across the Wahsatch range to the great South Pass of the Wind River Mountains, immediately S. of Frémont's Peak, and thence down the Sweetwater to the N. fork of the Platte. A more S. route connects Pike's Peak with the Utah basin, and thence turning S. W. crosses the Sierra Nevada near its junction with the Coast Range in northern California, meeting at this point the route from Santa Fé through New Mexico, and the still more S. one from Texas, which follows the valley of the Gila, and crosses that river and the Colorado at their junction. Mount St. Elias, in Alaska, is one of the highest peaks of this extensively ramified mountain system, though claimed to be surpassed in height by the neighboring Mount Logan. For relative mountain heights, see MOUNTAIN. The mineralogical, geological, and botanical characteristics of the various ranges of the Rocky Mountains' chain are treated in this work under the names of the several States, Territories, and regions with which it has connection. The Rocky Mountains were first partially explored by Lewis and Clark's expedition in 1804. Subsequently explorations were made by Harman, Long, Schoolcraft, Nicollet, Bonneville, Frémont, and by many others.

ROCOCO, or **ROCAILLE**, a name given to the very debased style of architecture and decoration which succeeded the first revival of Italian architecture. It is ornamental design run mad, without principle or taste. The ornament consists of panels with their moldings broken or curved at the angles, and filled with leafage, shellwork, musical instruments, marks, etc. This style prevailed in Germany and Belgium during the 18th century, and in France from the time of Henry IV. to the Revolution.

ROCROI, or ROCROY, a small fortified town of France, department of Ardennes, near the Belgian frontier; celebrated for the victory gained (1643) by the Duke d'Enghien (afterward the great Condé) over the Spaniards.

ROD, called also a pole, or perch, a measure of length, equivalent to 5½ yards, or 16½ feet. The square rod, called generally a rood, is employed in estimating masonry work, and contains 16½×16½, or 272¼ square feet.

ROD, EDOUARD (rod), a French novelist and critic; born in Nyon, in 1857. He published many works of criticism and erudition, among them being: "À propos de 'L'Assommoir'" (1879); "The Germans at Paris" (1880); and "Wagner and the German Æsthetic" (1886). But he is better known as a novelist, and has published: "The Fall of Miss Topsy" (1882); "The Deathward Career" (1885); "The Meaning of Life" (1889); "Stendhal" (1891); "The Sacrificed One" (1892); "In the Middle of the Road" (1900); etc. He lectured in New York before the French Society. He died Jan. 29, 1910.

RODENTIA, or RODENTS, an order of mammiferous quadrupeds occupying in many respects an intermediate place between the purely carnivorous and purely herbivorous mammalia, and so forming the connecting link between them. The order embraces rats and mice, hares, rabbits, guinea pigs, and other well-known animals. These animals have two great incisor teeth in each jaw, separated from the molar by a wide space, with which they could hardly seize a living prey or rend flesh, but could reduce them by gnawing, whence the term rodents, or gnawers, applied to this order. The characteristic of this order is that the lower jaw has no horizontal movement except from behind forward, and vice versa, convenient for the action of gnawing; the molars of the *Rodentia,* consequently, have flat crowns, the enameled eminences of which are always transversal, so as to be in opposition to the horizontal movements of the jaw, and to be better adapted for trituration. The hinder parts of the body of the rodents in general exceed their anterior.

Some of them enjoy a certain dexterity, using their forefeet for carrying their food to their mouth; while others again (the squirrels) climb trees with facility. Rodents are most abundant in temperate regions. In North America there are 371 species, 19 genera; 81 species, 16 genera in Europe and the N. of Asia; in Africa, 53 species, 16 genera; in India and its islands, 58 species, 10 genera; in South America and West India Islands, 89 species, 25 genera.

RODERIC, "the last of the Goths," whose tragic death, coincident with the downfall of the Visigothic monarchy in Spain, has inspired poets and romancers (Scott, Southey, Geibel, Dahn) to throw round him a halo of glory. According to the commonly accepted legend he was the son of a noble who was blinded by King Witiza. A conspiracy having been formed against the hated Witiza by the clergy and the nobles of Roman blood, Roderic was elevated to the throne (710). The sons of Witiza, however, bided their time, meanwhile submitting to the usurper. At length certain malcontent nobles were engaged in a plot to dethrone Roderic by Count Julian, the governor of Ceuta (in north Africa), whose daughter had been outraged by the Visigothic king. Julian brought over with him a Moorish chief named Tarik at the head of 12,000 men. Roderic met the invading army on the banks of the Guadalete, near Xeres de la Frontera, on July 26, 711. The battle raged six days; but the sons of Witiza, who commanded the wings of the Christian army, deserted during the contest, and the rout of the Visigoths was complete. Roderic either died on the field or was drowned in the Guadalete while attempting to swim his horse across. A third version, however, relates that he escaped and passed the rest of his life as a pious hermit. By this victory the Arabs became masters of southern Spain.

RODGERS, CHRISTOPHER RAYMOND PERRY, an American naval officer; born in Brooklyn, N. Y., Nov. 14, 1819. In 1833 he entered the United States navy as a midshipman; was in active service during the Seminole and Mexican Wars; and in 1861 became commander. In that year, in the "Wabash" of Admiral Dupont's squadron, he was fleet-captain at the battle of Port Royal. He commanded, in 1862, an expedition to St. Augustine and up the St. Mary's river. In the attack on the defenses of Charleston, April 7, 1863, he was fleet-captain on the "New Ironsides." He was appointed superintendent of the United States Naval Academy 1874-78, and 1881, and in the year 1874 was promoted rear-admiral. He was retired in 1881; and died in Washington, D. C., Jan. 8, 1892.

RODGERS, JOHN, an American naval officer; born in Harford co., Md., July 11, 1771; son of a Scotch colonel of militia. He was a captain in the merchant service by 1789, and in 1798 entered the navy as lieutenant, becoming captain the year after. In 1805 he extorted from

Tripoli and from Tunis treaties abolishing the former tribute and forbidding the slavery of Christian captives. On June 23, 1812, he fired with his own hand the first shot in the war with Great Britain, and during the war he took 23 prizes. He died Aug. 1, 1838.

RODGERS, JOHN, an American naval officer; born in Maryland, Aug. 8, 1812. He entered the naval service in 1828 and soon showed that he had inherited the bravery of his father, Commodore John Rodgers. He was in the war against the Seminole Indians and rendered excellent service during the Civil War. In November, 1861, he took part in the battle of Port Royal, and in November, 1862, he led an attack on Drury's Bluff, on the James river, in which he was repulsed. He commanded the "Weehawken" in the attack on Fort Sumter, in April, 1863, and in the same year he captured the Confederate ironclad "Atlanta," near Savannah. He was promoted rear-admiral in 1869, and in 1877-1882 was superintendent of the United States Naval Observatory. He died in Washington, D. C., May 5, 1882.

RODGERS, JOHN AUGUSTUS, an American naval officer, born at Havre de Grace, Maryland, in 1848. He graduated from the United States Naval Academy in 1868, and was appointed ensign in 1869, rising successively to the rank of rear-admiral in 1908. He saw active service during the Civil War and took part in the battle of Santiago, Cuba, in July, 1898. His various other assignments included service with the torpedo service, at the Washington Navy Yard, the Naval War College, the light-house service, etc. From 1904 to 1906 he was in command of the "Illinois," and from 1908 to 1910 he was in command of the Navy Yard, Puget Sound, Washington, retiring in July, 1910.

RODGERS, RAYMOND PERRY, an American naval officer, born in Washington, D. C., in 1849. He graduated from the United States Naval Academy in 1868 and was appointed ensign in 1869, rising successively to the rank of rear-admiral in 1908. He served from 1893 to 1897 as naval attaché in France and Russia, from 1897 to 1899 as executive officer of the "Iowa," taking part in the battle of Santiago, Cuba. From 1899 to 1901 he was in command of the "Nashville," seeing service in the Philippines, and in China during the Boxer troubles. From 1904 to 1906 he was in command of the "Kearsarge," from 1906 to 1909 chief intelligence officer of the Navy Department, and from 1907 to 1911 president of the Naval War College and commandant of the naval station in Narragansett, Bay, retiring in December, 1911.

RODIN, AUGUSTE, a French sculptor; born in Paris, France, in 1840, studied under Barye, and began to exhibit in the Salon in 1875. He has produced great scriptural and symbolical groups, but is best known by his portrait busts and statues, notably the busts of Victor Hugo and Balzac; though his "Apollo," "Young Girl," "The Kiss," and his panels are equally great. He is represented in the Metropolitan Museum, New York, by "The Hand of God," "The Bather," a bust of St. John and 18 other pieces. In 1904 he succeeded Whistler as President of the International Society of Sculptors, Painters and Engravers. He died Nov. 17, 1917.

AUGUSTE RODIN

RODMAN, HUGH, an American naval officer, born at Frankfort, Ky., in 1859. He graduated from the United States Naval Academy in 1880 and from the Naval War College in 1907. Having been promoted ensign, junior grade, in 1883, he gradually rose to the rank of rear-admiral in 1917. In the Spanish-American War he served on the "Raleigh." Besides service on various United States vessels his assignments included service with the light-house department, at the Navy Yard, Mare Island, Cal., etc. From 1914 to 1915 he was superintendent of transportation, Panama Canal. From

1915 to 1916 he was in command of the "New York," and from 1916 to 1917 he was a member of the general board of the Navy Department. During the World War he was successively in command of division 3, Atlantic Fleet; squadron 1, Battleship force, Atlantic Fleet; division

REAR-ADMIRAL HUGH RODMAN

3, Battleship force 1, Atlantic Fleet; division 9, Battleship force, on duty with British Grand Fleet; and of United States battleships. He was a director of the Panama Railroad Co. He received the Battle of Manila Bay and Spanish-American War medals, the D. S. medal, and from Great Britain, the K. C. B., for services in the World War.

RODNEY, CÆSAR, an American patriot; born in Dover, Del., Oct. 7, 1728. In 1755 he was made sheriff of Kent co., Del., and at the expiration of his term became justice of the peace and judge of all the lower courts. In 1765 he was a delegate to the Stamp Act Congress in New York. In 1767, when the tea act was proposed in the British Parliament, the Delaware Assembly appointed him to aid in the formulation of an address of remonstrance to the king. In 1775 he was elected for a second time to the Continental Congress, and in May of that year became Brigadier-General of the Delaware militia. He served with distinction during the Revolutionary War under Washington, becoming, in 1777, a Major-General. He was elected president of Delaware, in which office he served till 1782, when he was re-elected to Congress, but did not take his seat because of illness. As a public man he displayed great integrity and elevation of character. He died in Dover, Del., June 29, 1784.

RODNEY, GEORGE BRYDGES, LORD, an English naval officer; born in Walton-upon-Thames, England, Feb. 19, 1718. He was created rear-admiral in 1759, and distinguished himself in several expeditions. In 1780 he defeated the Spanish fleet and took several ships. This was followed soon after by a more splendid victory, and the capture of the Spanish admiral, Don Juan de Langara. But the most important achievement of this brave admiral was the defeat of the French fleet under Count de Grasse in the West Indies in 1782, when the French admiral and a number of his ships were taken. He died in London, May 24, 1792.

RODRIGUEZ, or **RODRIGUES**, a hilly volcanic island (1,760 feet), 13 miles long by 7 broad, 370 miles E. by N. of Mauritius, of which it is a dependency. Rodriguez is a cable station. The soil is fertile, and agriculture is the chief occupation. Hurricanes often cause great damage to the island, which is encircled by a coral reef. It was discovered by the Portuguese in 1645, and has been a British colony since 1810. The chief port is Port Mathurin. Owing to its isolation this island is particularly interesting to the botanist and the zoölogist. Till near the close of the 17th century it was the home of the solitaire, now an extinct bird.

ROE (*Capreolus caprea*), a small species of deer inhabiting Europe and some parts of western Asia, chiefly in hilly or mountainous regions. It is seldom found in the higher and more naked mountain tracts, the haunt of the stag or red deer. It was once plentiful in Wales and in the hilly parts of England, as well as in the S. of Scotland, but is now very rare S. of Perthshire. The roe is about 2 feet 3 inches in height at the shoulder. Its weight is about 50 or 60 pounds. Its color is a shining tawny-brown in summer, more dull and grizzled in winter. The tail is very short, concealed among the hair. The antlers, which are peculiar to the male or roebuck, are eight or nine inches long, erect, round, very rough, longitudinally furrowed; having, in mature animals, two or three tines or branches, which, as well as the tip of the horn, are sharp-pointed, so that the antlers form very dangerous

weapons. The habits of the roe are somewhat like those of the goat, or even of

ROE BUCK

the chamois. Contrary to what is usual among deer, the male and female remain

HEAD OF ROE BUCK

attached during life. The voice of the roe-deer, resembling that of a sheep, but shorter and more barking, is often heard through the night. The venison is superior to that of the stag, but not equal to that of the fallow deer. The horns are used for handles of carving knives and similar articles.

ROE, CHARLES FRANCIS, an American military officer; born in New York City, May 1, 1848; was graduated at the United States Military Academy in 1868, and was assigned to the 2d Cavalry, then on the Pacific slope. In 1898 he was appointed a Brigadier-General of volunteers. He died in 1900.

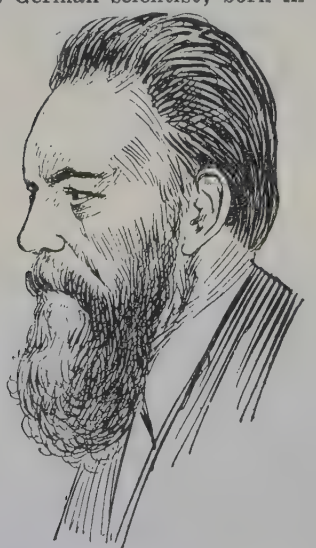
ROE, EDWARD PAYSON, an American novelist; born in Orange co., N. Y., March 7, 1838. He wrote a great number of very popular novels. His first novel, "Barriers Burned Away" (1872), met with immediate success, and was followed by "What Can She Do?" (1873); "The Opening of a Chestnut Burr" (1874); "From Jest to Earnest" (1875); "Near to Nature's Heart" (1876); "A Knight of the Nineteenth Century" (1877); "A Face Illumined" (1878); "A Day of Fate" (1880); "Without a Home" (1881); "His London Rivals" (1883); "Nature's Serial Story" (1884); "Driven Back to Eden" (1885); "He Fell in Love With His Wife" (1886); "The Earth Trembled" (1887); "A Hornet's Nest" (1887); "Found, Yet Lost" (1888); "Miss Lou" (1888); and "Taken Alive, and Other Stories." He died in Cornwall, N. Y., July 19, 1888.

ROEBLING, JOHN AUGUSTUS, an American engineer; born in Muhlhausen, Prussia, June 6, 1806; came to the United States in 1831, and settled in Pittsburgh, Pa. His first work was as assistant engineer on the dock navigation of Beaver river, a tributary of the Ohio. He soon found employment in the Pennsylvania State service, and for three years was engaged in surveying and locating three railroads from Harrisburg to Pittsburgh across the Allegheny Mountains. These roads were in due course built by the Pennsylvania Railroad Company. In 1844 he secured the contract to remove the wooden aqueduct of the Pennsylvania canal across the Allegheny river, which had become unsafe and to replace it with a new structure. His next piece of construction was the Monongahela suspension bridge at Pittsburgh. He then, within two years, built a series of four suspension aqueducts on the line of the Delaware and Hudson canal, connecting the Hudson river with the anthracite coal regions of Pennsylvania. He removed from Pennsylvania about this time, to Trenton, N. J., where he established his wire works. He next built a

suspension bridge across the chasm of the Niagara river to unite the New York Central and Great Western (Canada) railroads. He began the Cincinnati suspension bridge in 1856 and completed it in 1867. His greatest work was the first bridge over the East river, connecting New York and Brooklyn. He died while the construction was in progress, in Brooklyn, July 22, 1869, and the bridge was completed by his son.

ROEBLING, WASHINGTON AUGUSTUS, an American civil engineer; born in Saxonburg, Pa., May 26, 1837; son of the preceding. He was graduated at the Rensselaer Polytechnic Institute, Troy, N. Y., in 1857; was an engineer officer during the Civil War and attained the rank of colonel of volunteers. In 1865 he resigned from military service to become assistant to his father in constructing the suspension bridges at Cincinnati and Pittsburgh. In 1869 he was assistant engineer under his father in the construction of the first suspension bridge over the East River between New York and Brooklyn; and on his father's death became chief engineer, which post he held till the completion of the bridge in 1883. He then became president of the large wire manufactory at Trenton, N. J. He published many valuable engineering reports, notably several relating to the construction of the East river bridge.

ROENTGEN, WILLIAM CONRAD, VON, a German scientist; born in Prussia in 1845; was graduated in medicine at the University of Zurich in 1869, and



WILLIAM CONRAD VON ROENTGEN

accompanied Professor Kundt, his teacher, to Würzburg, where he engaged in practice. He went to Strasburg, in 1873, as assistant professor, and for 20 years was conspicuous as Professor of Mathematics and Physics, and also as a scientist. In November, 1895, Roentgen made the discovery of what has since been known as the Roentgen, or X-rays. The German emperor bestowed the Order of the Royal Crown on the discoverer, who afterward also was ennobled. He received the Nobel Prize for physics in 1901.

ROENTGEN, or RÖNTGEN, RAYS, certain invisible non-refractable rays emanating from the surface of an electrically excited vacuum tube opposite the cathode electrode, having power (1) of permeating objects impervious to light or heat rays, (2) of discharging electrified bodies or surfaces exposed to them, (3) of exciting fluorescence in fluorescent salts, and (4) of affecting sensitized photographic plates in a manner similar to light rays. They were discovered by William Conrad Roentgen, Professor of Physics at the Royal University of Würzburg, in Germany, toward the close of the year 1895. Not being certain as to the nature of the rays, Professor Roentgen provisionally termed them the X-rays, and they are still commonly known by that name, though the name Roentgen rays is also common. At the beginning of 1894, Prof. P. E. A. Lenard, at Bonn, announced the discovery that by using a Crookes tube in which the cathode rays were made to impinge on a thin sheet of aluminum a screen covered with a phosphorescent substance outside the tube could be made to phosphoresce by their action. That, further, it was possible by means of these cathode rays, as he supposed, to obtain "shadows" of objects through optically opaque substances and to produce an impress of these "shadows" on photographic plates, which could afterward be developed and fixed by ordinary photographic processes. Working on this line of investigation Professor Roentgen inclosed an excited vacuum tube in blackened cardboard treated with barium platino-cyanide, and discovered that the cathode beam is accompanied by certain rays not before known, which, though of phosphorescent and photographic quality, differ from any known form of light in not being susceptible of refraction.

These were the wonderful X-rays, which have opened up to the world a new region of scientific exploration. Besides obtaining radiographs of the bones in the living human hand, Professor Roentgen radiographed a compass card completely inclosed in a metallic box. From these and similar experiments he inferred

that these newly discovered rays generated in the neighborhood of the Crookes tube by the electric disturbance set up by the passage of a current possessed the property of passing through all bodies in their path, and that some bodies, being less permeable than others, cast a shadow. Subsequent experiments have established the fact that the transparency of a body to the X-rays is proportional to its density. As to the real nature of the X-rays eminent physicists differ, but all agree that they must be regarded as of a nature essentially different from ordinary light. They cast an invisible life-size shadow of the objects that obstruct their passage, which invisible shadow if received on a surface which phosphoresces or glows under their action becomes a visible shadow, which makes the wonderful revelations of the fluoroscope possible. If this invisible shadow is received on a sensitive plate, the plate is impressed, and on subsequent development the representation of the obstructing object is perpetuated on the photographic plate.

The Roentgen rays pass very freely through the various tissues and fluids of the body, but are obstructed by the bones; hence it is possible to take a perfect shadow-picture, or radiograph, as it is now generally called, of the bones of a living person or animal. By far the most important result of the discovery has been the application of the new rays to surgery. Needles, bullets and other foreign objects in various parts of the body have been successfully located, and the invention of the FLUOROSCOPE (*q. v.*) has made it possible to use the Roentgen rays, not only in surgical cases, in searching for fractures, etc., but to undertake anatomical studies and make the diagnosis of internal diseases. The full physiological effects of the X-rays are not yet clearly understood. Experiments show that long exposure to the rays causes acute maladies of the skin and also baldness.

ROGATION DAYS, the Monday, Tuesday, and Wednesday before Holy Thursday or Ascension Day, so called from the supplications or litanies which are appointed in the Roman Catholic Church to be sung or recited in public procession by the clergy and people. In England, after the Reformation, this practice was discontinued, but it survives in the custom (observed in some places) of perambulating the parish boundaries.

ROGER I., Count of Sicily, the youngest of the 12 sons of Tancred de Hauteville of Normandy; born in that duchy in 1031. When 27 years of age he joined his famous brother Robert Guiscard in south Italy; but at first he seems to have fought against Robert more than he helped him. At length they became reconciled, and Roger helped Robert to complete the conquest of Calabria. In 1060 Roger was invited to Sicily to fight against the Saracens: he took Messina and settled a garrison there. Everywhere the Normans were welcomed by the Christians of Sicily as their deliverers from the Moslem yoke, and they won town after town, till in 1072 the Saracen capital, Palermo, was captured. Robert then invested Roger with the countship of Sicily. Count Roger spent the rest of his life, apart from his numerous expeditions undertaken for the support of his brother, in completing the conquest of Sicily, which was finally effected in 1090. Already as early as 1060 Duke Robert had given his brother the half of Calabria, with the title of count. After Robert's death (1085) Roger succeeded to his Italian possessions, and became the head of the Norman power in southern Europe. Pope Urban II. granted him special ecclesiastical privileges, such as the power to appoint the bishops, and made him papal legate of Sicily (1098). Roger died in Mileto, Calabria, in June, 1101.

ROGER II., King of Sicily, second son of the preceding; born in 1093. When he came of age he executed his task of governing Sicily with great ability and courage, and his sway was gradually extended over a great part of southern Italy. By the Anti-Pope Anacletus in 1130 he was honored with the title of king. In spite of repeated revolts of the barons, and though the German Emperor Lothair and the Greek Emperor Emmanuel were leagued against him, and Innocent II. excommunicated him, he defended himself with success and defeated the Pope's forces at Galluzzo, taking Innocent prisoner. Peace was made, the Pope annulled all excommunication against Roger, and recognized his title of king. Roger afterward fought with success against the Greeks, took Corfu, and gained part of the N. coast of Africa. He died in 1154, and was succeeded by a son and a grandson.

ROGERS, HENRY HUDDLESTONE, an American capitalist, born at Fairhaven, Mass., in 1840. He was educated in the Fairhaven High School, and after being newspaper seller, clerk, and railroad worker, went to Pennsylvania and settled at McClintock's Wells. Here he entered the oil business and had great success in the kerosene industry. In 1870 he settled in New York and in 1874 cooperated in the establishment of the

Standard Oil Company. Eventually he became vice-president and was regarded as executive head. The money he made in oil he invested in other business, so that he became connected with the Amalgamated Copper Company, United States Steel Corporation, the National Transit Company, and other mining, railroad, and industrial undertakings. He built the Tidewater railroad, 442 miles in length, exclusively with his own capital. He left over $100,000,000. Died 1909.

ROGERS, HENRY WADE, an American jurist and economist, born in Holland Patent, N. Y., in 1853. He graduated from the University of Michigan in 1874. After studying law he was admitted to the bar in 1877. He was connected with the law department of the University of Michigan from 1883 to 1891. From 1890 to 1900 he was president of the Northwestern University. In 1913 he was appointed United States Circuit Judge. He was chairman of the World's Congress on Jurisprudence and Law Reform, in 1893, and general chairman of the Saratoga Conference on the Foreign Policy of the United States, in 1898. He took a prominent part in the activities of the Methodist Episcopal Church and acted as an official of many important committees. In 1908 he was chairman of the Committee on International Relations in the Federal Council of the Churches. He was delegate to many international conferences on prison reform and other subjects. He wrote "Expert Testimony" (1883); "Introduction to Constitutional History as Seen in American Law" (1889). He contributed many articles to encyclopedias and reviews.

ROGERS, JAMES EDWIN THOROLD, an English economist; born in Hampshire, England, in 1823; was Professor of Political Economy at Oxford, and will be remembered as a historian of economics. His principal work is "The History of Agriculture and Prices in England" (1866-1888), of which "Six Centuries of Work and Wages" (1885) is an abridgment. Among his other writings are: "Cobden and Modern Political Opinion" (1873); "The First Nine Years of the Bank of England" (1887); "The Economic Interpretation of History" (1888); and "The Industrial and Commercial History of England" (1892). He died in Oxford, Oct. 12, 1890.

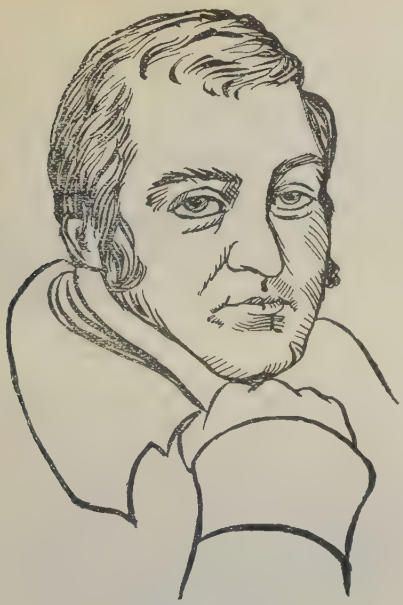
ROGERS, JOHN, an American sculptor; born in Salem, Mass., Oct. 30, 1829; was a machinist in early life; developed a talent in clay modeling; and in 1858 went to Europe to study plastic art in Paris and Rome. He returned to the United States in 1859, and afterward produced a large number of statuettes in clay of a new composition. His first group, "The Checker Players," attracted popular attention. He became noted for statuette groups. He also executed the equestrian statue of General Reynolds, now at the city hall in Philadelphia. He died July 27, 1904.

ROGERS, RANDOLPH, an American sculptor; born in Waterloo, N. Y., July 6, 1825; studied art in Europe in 1848-1850, spending most of the time in Rome. He then returned to the United States; for five years had a studio in New York, and established himself in Rome in 1855. He executed the bronze doors of the National Capitol at Washington, D. C., and also several portrait statues and memorial monuments in Providence, Richmond, Detroit, and other cities. He produced busts that became famous, "Nydia," "Isaac," "Ruth," etc. His work was classed as "ideal." He died Jan. 15, 1892.

ROGERS, ROBERT WILLIAM, an American orientalist, born in Philadelphia, 1864. He was educated at the Central High School, Philadelphia, University of Pennsylvania, Johns Hopkins University, Haverford College, and the University of Leipzig, receiving the degree of Ph.D. from the latter two institutions, and honorary degrees from several American universities as well as from the University of Dublin. From 1887 to 1888 he was instructor of Greek and Hebrew at Haverford College; from 1890 to 1892 professor of English bible and Semitic history at Dickinson College, and from 1893 professor of Hebrew and Old Testament Exegesis, Drew Theological Seminary. He was a member of numerous domestic and foreign oriental and archæological societies as well as a member of various congresses of orientalists. He wrote: "Two Texts of Esarhaddon" (1889); "Catalogue of Manuscripts" (1890); "Inscriptions of Sennacherib" (1893); "Outlines of the History of Early Babylonia" (1895); "History of Babylonia and Assyria" (1900), 6th edition rewritten (1915); "The Religion of Babylonia and Assyria" (1909); "Cuneiform Parallels to the Old Testament" (1912); "The Recovery of the Ancient Orient" (1912).

ROGERS, SAMUEL, an English poet; born in Newington Green, London, July 30, 1763. His wealth, liberality, and social qualities gave his productions a great vogue. His best poem is the "Pleasures of Memory" (1792). He wrote also: "The Voyage of Columbus" (1812); "Jac-

queline" (1813); "Human Life" (1819); and "Italy" (1822). He was the intimate



SAMUEL ROGERS

friend of nearly all the literary men of his time in Great Britain. He died in London, Dec. 18, 1855.

ROGERS, SAMUEL LYLE, an American director of census, born in Franklin, N. C., in 1859. He was educated in Franklin High School. After some years in the retail merchandise business he was clerk of the Superior Court, Macon co., N. C., from 1882 to 1893, collector of internal revenue for the western district of N. C. from 1895 to 1897; a member of the N. C. State Corporation Commission from 1899 to 1911. In March, 1915, he was appointed director of census by President Wilson. He was a member of the American Statistical Association.

ROGET, PETER MARK, an English physician; born in London, England, Jan. 18, 1779; was educated at Edinburgh; became physician to the Manchester Infirmary in 1804; and in 1808 settled in London, where he became physician to the Northern Dispensary; F. R. S. (1815), and afterward for over 20 years its secretary; Fullerian Professor of Physiology at the Royal Institution; and an original member of the senate of the University of London. He wrote one of the "Bridgewater Treatises"—"On Animal and Vegetable Physiology Considered with Reference to Natural Theology" (1834), and the more famous "Thesaurus of English Words and Phrases" (1852). He died in Malvern, Sept. 17, 1869.

ROGGEVELD MOUNTAINS, a range in the S. W. division of Cape Colony, running N. W. to S. E. with an average height of 5,000 feet.

ROGUE, an idle, slothful, inactive person; in the legal sense, a vagrant; a vagabond; a sturdy beggar. A knave; a rascal; a wilfully dishonest person; a cheat; a trickster. A name of slight tenderness or endearment for one who is mischievous or frolicsome; as, a wicked rogue (in irony).

ROHAN, HENRI DE, a French Protestant leader; born in Brittany, France, Aug. 25 (or 21), 1579. He is less remarkable for military achievements than for his four books of memoirs: the first three published under the title "Memoirs on Events in France from the Death of Henry the Great to June, 1629" (1644), covering the civil wars; and the fourth as "Memoirs and Letters on the War of the Valtelline" (1758), whither Richelieu had sent him to keep off the Imperialists and the Spanish. They rank among the finest of the memoirs written by the aristocracy of the 16th and 17th centuries. He also wrote "The Perfect Captain" (1636), a political tract; and others. He died April 13, 1638.

ROHAN, LOUIS RÉNE ÉDOUARD, PRINCE DE, Cardinal-Archbishop of Strasburg; born in 1734. He became coadjutor to his uncle in the see of Strasburg, and afterward his successor; was sent in 1772 as ambassador to Vienna, where he displayed the most ridiculous luxury, but vainly sought to obtain the favor of the Empress Maria Theresa. As coadjutor he had ceremonially received the Princess Marie Antoinette on her entrance into France. On the death of Louis XV. he returned to Paris, and for 10 years bent all his energies and efforts to winning the favor of the queen, but all in vain. Nevertheless he had meanwhile become, in spite of his known profligacy, Archbishop, Grand-Almoner, Cardinal and Commendator of St. Vaast of Acres, one of the richest benefices in France. Associate of the quack Cagliostro, and of the infamous Madame Lamotte, he was duped by a forged letter with the signature of the queen, and induced to buy of Boehmer, the court jeweler, the now too celebrated diamond necklace, in the name of the queen. The necklace was placed in the hands of Madame Lamotte, forged autograph messages from the queen followed, and an interview in the park of Versailles be-

tween the cardinal and a fair adventuress personating the queen. On the discovery of the fraud, Rohan was summoned before the king, answered vaguely and unsatisfactorily, and was arrested and imprisoned in the Bastile, Aug. 15, 1785. After a year's proceedings he was acquitted and released, but at the same time exiled from the court, and deprived of his grand-almonership. He was deputy to the States-General in 1789; was afterward accused of various disloyal intrigues and maladministration; gave up his see in 1801, and died in 1803.

ROHILKHAND, or **ROHILCUND**, a division of the provinces of Agra and Oude in British India; area, 10,885 square miles; pop. about 5,345,000. The surface is a plain, with a gradual slope S., in which direction its principal streams, Ramganga, Deoha, and others, flow to the Ganges. It takes its name from the Rohillas, an Afghan tribe, who gained possession of it early in the 18th century.

ROHLFS, MRS. See GREEN, ANNA KATHERINE.

ROLAND (Italian, *Orlando;* Spanish, *Roldan*), the name of the most prominent hero in the Charlemagne legend. Unlike most legendary heroes, Roland is a figure in history as well as in poetry and fable. All that we know of him is contained in one line of Eginhard's "Vita Karoli," chap. ix., and that simply records his name, Hruodlandus, his rank of prefect or warden of the march of Brittany, and his death at the hands of the Gascons in a valley of the Pyrenees.

The oldest form in which we have the "Chanson de Roland" is that of the MS. in the Bodleian Library, Oxford, written presumably toward the end of the 12th century; but this is evidently by no means its oldest form as a consecutive poem.

Besides the Oxford MS. there are half a dozen others ranging from the 13th to the 16th century. The differences between the earlier and later are significant. In the Oxford MS., which is one of the little pocket copies carried by the jongleurs, the assonant rhyme (that which disregards the consonants and depends on the accented vowel) is maintained throughout, the same assonance being kept up to the end of each break or paragraph. In the later MSS. the assonant is turned into the full consonant rhyme, and the poem expanded to twice or thrice its former length. The first shape is the poem as sung; the second as adapted for readers when the minstrel was no longer the sole vehicle, for poetry and reading was becoming a common accomplishment. A very close German version, the "Ruolandes Liet," shows that early in the 12th century the chanson had passed out of its native country and language; and it is almost as closely followed in the Icelandic "Karlamagnus Saga" of the 13th. The "Chanson de Roland" is the foundation of the Charlemagne legend. Charles's wars and quarrels with his vassals would no doubt of themselves have furnished themes for the jongleurs, but the legend, culminating in the Morgante of Pulci and the Orlandos of Boiardo and Ariosto, is the outcome of the story of Roland and Roncesvalles.

ROLAND, MANON JEANNE PHILIPON, MADAME, wife of Jean Marie and herself the spirit of the Girondin party; the daughter of a Paris engraver; born in that city, March 17, 1754. She was the only child of nine, left to the

MADAME ROLAND

care of her father, who provided her with masters regardless of expense and gave her a brilliant education; the best grounds for which existed in her native talents, her firm spirit, her personal beauty, and her undoubted virtues. Antiquities, heraldry, philosophy, and, among other books, the Bible, made up her earliest studies; her favorite authors, however, were Plutarch, Tacitus, Montaigne, and Rousseau. She became the wife of Roland in 1781. She became the sharer in all his studies,

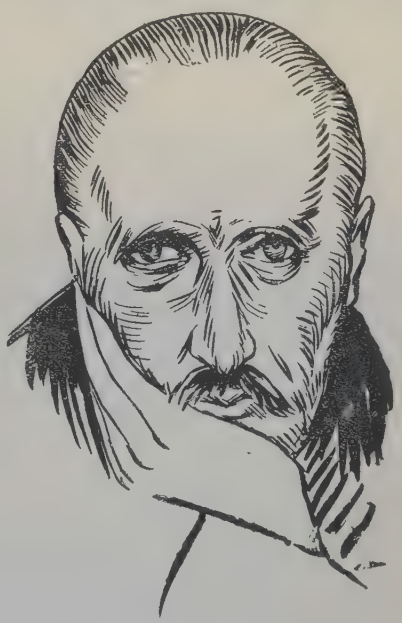
aided him in editing his works, and during his two ministries acted as his secretary and entered into all the intrigues of his party without debasing herself by their meanness. After the flight of her husband, Madame Roland was arrested by order of the Paris Commune under the dictation of Marat and Robespierre, and consigned to the Abbaye prison, from which, on Oct. 31, she was removed to a more wretched abode in the Conciergerie. When sentenced at the bar of Fouquier Tinville she was eager to embrace her fate. She declared her conviction that her husband would not survive her. (He committed suicide.) On the scaffold she apostrophized the statue of liberty near-by—"Ah, Liberty! what crimes are committed in thy name!" Besides her miscellaneous works, Madame Roland left "Memoirs" composed during her captivity, and a last affecting composition in the "Counsels of a Letter," addressed to her little girl. She was executed Nov. 8, 1793.

ROLAND DE LA PLATIÈRE, JEAN MARIE, a French statesman; born in Villefranche, France, Feb. 18, 1734; was inspector-general of manufactures and commerce in that city when the French Revolution commenced, and having embraced popular principles became, in 1790, member of the Lyons municipality. In February, 1791, he was sent to Paris as deputy extraordinary to defend the commercial interests of Lyons in the committees of the Constituent Assembly, and remained there seven months, accompanied by his gifted wife. The practical philosophy, commercial knowledge, and strict simplicity of Roland, recommended him to men of all parties, and when the patriot ministry was formed in March, 1792, he was made minister of the interior. He kept his position till June 13, when the royal veto on the proposal to form a patriot camp around Paris, and on the decree against the priests, provoked his celebrated letter to the king, written, however, by Madame Roland, and as a consequence, his almost instant dismissal. This event was followed by the arrival of the Marseillais in Paris, and the conflict at the Tuileries, on Aug. 10, when Roland was recalled, and Danton became minister of justice. The struggle between the Girondists and the municipality under the guidance of Robespierre filled up the period till May 31; the former party were then vanquished, and Roland was among the number who saved their lives by flight. He found an asylum with his friends at Rouen, but deliberately killed himself with his cane sword on hearing of the execution of his wife, Nov. 15, 1793.

ROLFE, JOHN CAREW, an American educator, born in Lawrence, Mass., in 1859, the son of William J. Rolfe. He graduated from Harvard University in 1881 and took post-graduate studies in Cornell and in Athens. From 1882 to 1885 he was instructor of Latin in Cornell, and he occupied the same post at Harvard in 1889–90. From 1890 to 1902 he was on the faculty of the University of Michigan, and from 1902 was professor of the Latin language and literature at the University of Pennsylvania. He edited various text-books and was a frequent contributor to scientific magazines.

ROLFE, WILLIAM JAMES, an American editor; born in Newburyport, Mass., Dec. 10, 1827. He was a distinguished Shakespearian scholar, and published many editions of Shakespeare, annotated; among them "The Friendly Edition," in 20 volumes (1870–1883), and a "School Edition," in 40 volumes. He also published: "Shakespeare, the Boy," annotated editions of selections from Tennyson, Scott, Browning, Wordsworth, Gray, Goldsmith and other English poets, and "Tales from English History." He died July 7, 1910.

ROLLAND, ROMAIN, a French author; born at Clamecy, in 1866. He received his education at the École Normale Supérieure, became a professor of



ROMAIN ROLLAND

the history of art at that school and taught there until the Sorbonne offered him a chair in his subject. He was recognized by the Academy in 1895 for his doctor's thesis. Later he wrote several plays, remarkable more for their style, vigor, and presentation of psychological analysis than for conformity to good dramatic construction. Beginning in 1903, he published noteworthy biographical and critical studies of musicians, artists, authors and upon aspects of the theater. He founded the "Revue Musicale" in 1901. As the author of "Jean-Christophe" he received one-quarter of the Nobel Prize in literature for 1915. This work, comprising three volumes has been translated into English and German.

ROLLER (*Coraciidæ*), a family of Picarian birds characteristic of the Ethiopian and Oriental regions, though the common roller is extensively distributed in the Palæarctic region and a few species enter the Australian region. None are found in the New World. Madagascar possesses three species peculiar to itself, and so different from one another that they are regarded as types of different genera, and so different from other rollers that they are grouped into a separate sub-family *Brachypteracianæ;* they are named ground rollers, and are nocturnal in habit. An Indian species, *Eurystomus orientalis,* is also nocturnal. The common roller (*Coracias garrula*) is an autumn or more rarely a spring visitor to the British Isles; and about 100 have been recorded since the first one was noticed by Sir Thomas Browne in 1644. Some have visited the Orkneys and Shetlands, one has been found as far W. as St. Kilda, and about half a dozen have been recorded from Ireland. It is a straggler to northern Europe; in central Europe it is common; in countries bordering on the Mediterranean it is very abundant. It ranges through Asia to Omsk in Siberia and to northwest India. In winter it extends its migrations to Natal and Cape Colony. In size it is about a foot long. The general color is light bluish green; the mantle is chestnut-brown; the wings and rump are adorned with beautiful azure blue. The female resembles the male in plumage. Nesting takes place in the woody haunts in May. The nest, which is made in a hollow tree or wall, is built of a few chips, or of roots, grass, feathers, and hair, according to circumstances. The eggs are five or six in number and are of a glossy white color. The food consists of beetles and other insects captured on the ground. The name "roller" is given to the bird on account of its varied and unsteady flight and the habit the male has, during the breeding season, of indulging in extraordinary tumbling antics, and turning somersaults in the air.

ROLLING MILL, a combination of machinery used in the manufacture of malleable iron and other metals of the same nature. By it the iron which is heated and balled in the puddling furnace is made into bars or sheets. It consists of rollers, journaled in pairs in metallic boxes in the iron standards or cheeks, and capable of being set toward or from each other by means of setscrews. The grooves in the rolls are so made as to be co-active in giving the required form to the heated iron passing between them. The face of each roller has a series of grooves gradually decreasing in size toward one end. The iron is passed through each in succession, being thus gradually reduced in size and increased in length. By this operation two objects are effected: (1) The scoriæ and other impurities are expelled, and (2) the required form whether of plate, bolt, or bar, is given to the metal.

ROLLINS, WALTER HUNTINGTON, an American educator, born in Newton, Mass., in 1869. He was educated at Dartmouth and at the Andover Theological Seminary. Ordained a congregational minister in 1898, he served as pastor in various churches, at Blackstone, Mass., and at Wilmington and Waterloo, Ia., until 1914, in which year he became president of Fairmount College, Wichita, Kan.

ROLPH, JAMES, JR., an American merchant and public official, born in San Francisco, Cal., in 1869. He was educated in the public schools and at Trinity Academy, San Francisco, beginning his mercantile career in 1888. He became a member of the firm of Hind, Rolph & Co., in 1898. He was an officer and director of various banks and shipbuilding concerns, as well as a vice-president of the Panama Pacific International Exposition. He was also a member and officer of the San Francisco merchant's exchange and of the ship owner's association of the Pacific Coast. He was mayor of San Francisco for three terms, beginning 1911.

ROMAN ARCHITECTURE. It can hardly be said that the early Romans had any style of architecture of their own, since they borrowed their ideas of building first from the Etruscans and afterward from the Greeks. In the time of Romulus their dwellings were of the rudest description, being chiefly com-

posed of straw; and at a later period, their temples were only small square buildings, scarcely large enough to contain the statues of their deities. The first king who constructed works of a large class requiring architectural skill was Ancus Martius. His first attempt was the building of the city and port of Ostia, at the mouth of the Tiber. During the time of Tarquin the Elder the city was much improved by the skill and enterprise of the Etruscans the great Circus was built, and the walls of the city constructed of large hewn stones. The great Cloaca, or public sewer, was also commenced, together with the temple of Jupiter Capitolinus. The decoration and improvement of the city was greatly increased during the reign of Tarquinius Superbus; but the Capitol was not finished till after the expulsion of the kings. During the first two Punic Wars many temples were erected; but they do not appear to have been of great magnificence. Altogether, very little taste had been shown in the Roman buildings till their conquests extended and they became intimate with the more costly buildings of their enemies. Metellus Macedonicus, the contemporary of Mummius, the victor of Corinth, was the first who built a temple of marble at Rome; but from that time most of the larger edifices were built of that material. Grecian art and architects were also introduced about the same period. Under Julius Cæsar, many new and magnificent buildings were erected; and during the Golden Age, under Augustus, most of the finest edifices were built; architects flocked from all quarters, and especially from Greece, to beautify the city. It was said of Augustus "that he found Rome built of brick and left it of marble." Under Vespasian and the Antonines architecture flourished, as the remains of the Coliseum and the temples of Antoninus and Faustina testify. After this period, however, architecture declined till Constantine transferred the seat of government to Byzantium, when a new style was introduced.

In comparing Greek and Roman architecture there can be no doubt that the former greatly excels in the matter of taste. Among the Greeks, moreover, religion was almost the sole purpose for which architecture seemed to exist; while among the Romans their temples were neither so extensive nor so numerous as their buildings of public utility or convenience. Besides a large number of engineering works, there are still the remains in Rome of fora, baths, palaces, circi, theaters, amphitheaters, libraries, halls of justice, triumphal arches, commemorative columns, mausolea, and similar buildings. The requirements of such edifices as these naturally led to the practice of composition and grouping, as one uniform plan of building would not have been suitable for such a variety of purposes. Another cause of variety lay in the employment of the arch, which allowed much greater latitude in compositions than the entablature of the Greeks. The semi-circular form of the arch next led to quite a new feature in architectural design—namely, the dome—a feature which gave a totally distinct character to buildings in which it was employed. The Pantheon is the most remarkable example of this arrangement. The circular plan of building became also a favorite one for tombs and mausolea. Among the most noted of these was the mausoleum of Hadrian, remains of which now form the well-known castle of St. Angelo; and the tomb of Cæcilia Metella. A characteristic feature in Roman architecture, and one that entered largely in the system, is the employment of order above order in the same building. The style of architecture called the Roman order was invented by the Romans from the Ionic and Corinthian orders; and hence it is sometimes called the Composite order.

ROMAN CATHOLIC CHURCH, the name of that community of Christians who profess the same faith, partake of the same sacraments and sacrifice, and are united under one head, the Pope or Bishop of Rome and successor of St. Peter, and under the bishops subject to him. Its essential parts are the Pope, bishops, pastors—so far as they are priests—and laity. The distinctive characteristic of the Roman Church is the supremacy of the papacy. Its doctrines, like those of the rest of Christendom, are chiefly found in the articles of the Nicene Creed. After the Council of Trent Pope Pius IV. added to the formal profession of faith the articles on transubstantiation, invocation of saints, and others which chiefly distinguish the Roman from other Christian communities. The Immaculate Conception of the Virgin Mary and papal infallibility were defined as articles of faith in 1854 and 1870 respectively. One great and central object of faith and worship is the Mass, which is the mystical sacrifice of the body and blood of Christ, instituted by Himself at the Last Supper, and is essentially the same as the Sacrifice of the Cross. Scripture and tradition are appealed to in support of this and other doctrines, as the Seven Sacraments, the honor due to the Blessed Virgin, Purgatory, Invocation of Angels and Saints, etc. There is a great distinction be-

tween what is of doctrine and what of discipline; the former belonging to the deposit of faith taught by Christ and the Apostles, which is invariable, while the latter, founded on the decisions and canons of councils and the decrees of Popes, is the Church's external policy as to government, and may vary according to times and circumstances.

The Sacred College of Cardinal.—The College of Cardinals—70 in number, after the 70 disciples—is the supreme council or senate of the Church and the adviser of the sovereign pontiff, and at the death of a Pope its members elect his successor (see POPE). They are also the chief members of the Sacred Congregations, or permanent ecclesiastical commissions (about 20 in number), to which much of the business of the Holy See is intrusted. Among the best known of these congregations are the Propaganda, the Index, the Inquisition or Holy Office, and the Congregation of Rites. The number of cardinals is hardly ever complete. In 1919 there were 14 patriarchal sees; 8 belonging to the Latin Rite and 6 Oriental. Archbishops, Latin Rite, 178; Oriental, 19. Bishops, 874, Latin Rite, 49 Oriental. There were 300 titular Bishops as coadjutors or engaged in mission work. Sacred congregations presided over by the Pope or cardinals for adjusting the spiritual and temporal affairs of the world, 13.

The leading prelate in the hierarchy, apostolic delegate and personal representative of the Pope at Washington in 1920, was his Excellency Archbishop John Bonzano. There were 14 archbishops (among them two cardinals at Baltimore and Boston); 96 bishops and 21,019 priests. There were 10,608 churches with resident priests and 5,573 mission churches. The Catholic population of the United States was 17,735,553, and including Alaska and insular possessions over 26,000,000. In the World War 762 secular and 264 priests of all orders were engaged in religious work.

ROMANCE. Romance has long since lost its original signification in every country except Spain, where it is still occasionally used in speaking of the vernacular, as it was in the Middle Ages when Latin was the language of the lettered classes and of documents and writings of all kinds. But even there its commoner application is, as elsewhere, not to a language, but to a form of composition. In English it has been almost invariably applied to a certain sort of prose fiction, and, in a secondary sense, to the style and tone prevailing therein. By "the romances," using the term specifically, we generally mean the prose fictions which, as reading became a more common accomplishment, took the place of the lays and "chansons de geste" of the minstrels and trouvères, and were in their turn replaced by the novel. Of these the most important in every way are the so-called romances of chivalry, which may be considered the legitimate descendants of the "chansons de geste." The chivalry romances divide naturally into three families or groups; the British (which, perhaps, would be more scientifically described as the Armorican or the Anglo-Norman), the French, and the Spanish; the first having for its center the legend of Arthur and the Round Table; the second formed round the legend of Charlemagne and the Twelve Peers; and the third consisting mainly of Amadis of Gaul followed by a long series of sequels and imitations of one kind or another.

ROMANCE LANGUAGES, a general name for those modern languages that are the immediate descendants of the language of ancient Rome. In those parts of the empire in which the Roman dominion and civil institutions had been most completely established the native languages were speedily and completely supplanted by that of the conquerors—the Latin. This was the case in Italy itself, in the Spanish peninsula, in Gaul or France, including parts of Switzerland, and in Dacia. When the Roman empire was broken up by the irruptions of the Northern nations (in the 5th and 6th centuries) the intruding tribes stood to the Romanized inhabitants in the relation of a ruling caste to a subject population. The dominant Germans continued, where established, for several centuries to use their native tongue among themselves; but from the first they seem to have acknowledged the supremacy of the Latin for civil and ecclesiastical purposes, and at last the language of the rulers was merged in that of their subjects; not, however, without leaving decided traces of the struggle—traces chiefly visible in the intrusion of numerous German words, and in the mutilation of the grammatical forms or inflections of the ancient Latin, and the substitution therefor of prepositions and auxiliary verbs.

It is also to be borne in mind that the language which underwent this change was not the classical Latin of literature, but a popular Roman language (*lingua Romana rustica*) which had been used by the side of the classical, and differed from it—not to the extent of being radically and grammatically another tongue—but chiefly by slovenly pronunciation,

the neglect or misuse of grammatical forms, and the use of "low" and unusual words and idioms. As distinguished from the old *lingua Latina*, the language of the Church, the school, and the law, this newly formed language of ordinary intercourse, in its various dialects, was known from about the 8th century as the *lingua Romana;* and from this name, through the adverb *Romanicé*, came the term romance, applied both to the language and to the popular poetry written in it, more especially to the dialect and poems of the troubadours. The Romance languages recognized by Diez are six—Italian, Spanish, Portuguese, Provençal, French, and Rumanian. Ascoli and newer investigators treat the Romansch of the Grisons as a seventh sister-tongue; and each of these have more or less numerous dialects.

The original Latin spoken in the several provinces of the Roman empire must have had very different degrees of purity, and the corruption in one region must have differed from those in another according to the nature of the superseded tongues. To these differences in the fundamental Latin must be added those of the superadded German element, consisting chiefly in the variety of dialects spoken by the invading nations and the different proportions of the conquering population to the conquered. French, as was to be expected, is richer in German words than any other member of the family, having 450 not found in the others. Italian is next to French in this respect, but on the whole is nearest to the mother Latin. Spanish and Portuguese have considerable Arabic elements; and Rumanian was much modified by Slavic. The Romance tongues further differ from the common parent in other details. The six great Romance tongues and their literatures are treated in the articles on Italy, Spain, Portugal, Provençal, France, and Rumania, to which may be added the Romansch.

ROMAN CEMENT, a dark-colored hydraulic cement, which hardens very quickly and is very durable. The true Roman cement is a compound of pozzuolana and lime ground to an impalpable powder and mixed with water when used. Other cements bearing the same name are made of different ingredients.

ROMANESQUE ARCHITECTURE, a general term applied to the styles of architecture which prevailed from the 5th to the 12th centuries. Of these there are two divisions: (1) The debased Roman, prevalent from the 5th to the 11th centuries, and including the Byzantine modifications of the Romans, and (2) the late or Gothic Romanesque of the 11th and 12th centuries, comprising the later Byzantine, the Lombard, and the Rhenish, Saxon, and Norman styles. The former is a pretty close imitation of the Roman, with modifications in the application and distribution of the peculiar features; the latter is Gothic in spirit, having a predominance of vertical lines, and various other new features.

ROMAN ROADS, certain ancient roads in Great Britain which the Romans left behind them. They were uniformly raised above the surface of the neighboring land and ran in a straight line from station to station. The four great Roman roads were Watling street, the Fossway, Icknield street, and Ermine street. Watling street probably ran from London to Wroxeter. The Fosse ran from Seaton in Devonshire to Lincoln. The Icknield Way ran from Iclingham, near Bury St. Edmunds, to Cirencester and Gloucester. The Ermine street ran through the Fenland from London to Lincoln. Besides these four great lines, which were long of great importance for traffic, there were many others.

ROMANS, EPISTLE TO THE, one of the books of the New Testament, written by the Apostle Paul, and addressed to the Christian Church at Rome. It is the 5th in order of time, though placed first among the epistles, either from the predominance of Rome, or because it is the longest and most comprehensive of the apostle's epistles. It is generally agreed to have been written about A. D. 58. That it is the genuine and authentic production is supported by the strongest evidence. It was written from Corinth, and sent to Rome by one Phœbe, a servant or deaconess of the Church at Corinth. The occasion of it was, doubtless, the disputes that began to prevail among the Christians at Rome. The Church there was composed of both converted Jews and Gentiles. The Jews wished to impose on their Gentile fellow-worshipers many of the Mosaic rites and ceremonies. The Gentiles, on the other hand, despised the prejudices of the Jews; hence trouble arose.

ROMANSCH, ROMANSH, or **ROUMANSCH**, a dialect spoken in the Grisons of Switzerland. It is based on or corrupted from the Latin.

ROMANTICISM, a movement in feeling and thought that has transformed the literature and art of most nations, has been defined by Theodore Watts as "the renascence of the spirit of wonder in poetry and art." It was a revolt

against pseudo-classicism; a return from the monotonous commonplace of everyday life to the quaint and unfamiliar world of old romance; a craving for the novel, original, and adventurous; an emphasizing of the interesting, the picturesque, the "romantic," at the expense, if need be, of correctness and elegance and the current canons of "good taste." Deep humor, strong pathos, profound pity are among its notes. Romanticism is not necessarily limited to any one period; there are romantic elements in Homer, Æschylus, Sophocles. The poetry of Dante is eminently romantic when contrasted with ancient classical poetry as a whole. There are certain epochs that are specially romantic, and certain writers in those epochs more romantic than their fellows. The 18th century was notoriously classic in ideal, or pseudo-classic—conventional, pedantic, academic; and the revolt against spiritual ennui which followed is the romantic movement par excellence. In England, the fountain-head of the movement which culminated in the beginning of the 19th century, it may be traced from the Percy Ballads and Chatterton, from Cowper and Blake and Burns, to Scott and Byron, Wordsworth and Coleridge, Keats and Rossetti. In Germany there were tendencies in that direction in Lessing, in Schiller, in Goethe, as well as in the philosophy of Schelling, and the "Sturm und Drang" period was largely romantic in its temper; but it was Novalis who was the prophet of "romanticism," and among the other representatives of the school were the Schlegels, Tieck, Kleist, Fouqué, and Hoffmann. In France beginnings are found in Rousseau, in Chateaubriand, and others; but the great chief of French romanticism is Victor Hugo. Other French romantics are Lamartine, Dumas, Gautier, George Sand, Flaubert, and Mürger. In music Weber has been called the "creator of romantic opera." Berlioz is regarded as the type of French romanticism in music.

ROME, a city and county-seat of Floyd co., Ga.; on the Coosa river, and on the Southern, the Central of Georgia, the Nashville, Chattanooga and St. Louis, the Rome and Northern and the Western and Atlantic railroads; 72 miles N. W. of Atlanta. Here are a high school, Shorter College for Women (Bapt.); hospitals, parks, waterworks, electric lights, street railroads, National and State banks, and daily and weekly periodicals. There is a large trade in cotton and general merchandise. The city has plow works, sewer pipe works, foundries, a rolling mill, stove works, furniture factory, planing mills, cotton mills, hosiery works, etc. Pop. (1910) 12,099; (1920) 13,252.

ROME, a city in Oneida co., N. Y.; on the Mohawk river, the Erie and Black River canals, and the New York, Ontario and Western, and the New York Central and Hudson River railroads; 15 miles N. W. of Utica. Here are St. Peter's Academy for Young Ladies, the State Custodial Asylum, the Central New York Institute for Deaf Mutes, County Court House, County Home, city hospital, street railroad and electric light plants, waterworks, the Jervis Library, National and savings banks, and several daily and weekly newspapers. The city has locomotive and farming implement works, machine shops, and cigar factories, and manufactures of brass and copper products, canned goods, wire, bedsteads, etc. Pop. (1910) 20,497; (1920) 26,341.

ROME, the most powerful state of antiquity; founded about 753 B. C. by a settlement from Alba Longa led by ROMULUS (*q. v.*). At first the new city was ruled by kings, but in 509 B. C. the people established a republic which lasted for 500 years. Its most important feature was the struggle between the plebeians and the patricians, settled finally in 286 B. C., by admission of the plebeians to a share in the government. Meanwhile Rome had been gradually spreading out, and by 275 B. C. was mistress of all Italy.

The next 30 years were crucial in the history of Rome. Her aggressive policy in the Mediterranean brought her face to face with CARTHAGE (*q. v.*), and under their military genius HANNIBAL, (*q. v.*) the Carthaginians threatened the very existence of Rome itself (see PUNIC WARS). Carthage was finally burned to the ground in 146 B. C. By 133 B. C. Rome had conquered Macedonia and Asia Minor.

At this point begins the decline of Rome as a republic. A series of bitter civil wars centralized the governing power in the hands of a few leaders (see SULLA: MARIUS: POMPEY: CÆSAR: TRIUMVIRATE); and in 48 B. C. Julius Cæsar was created Imperator. With Cæsar the republic and Rome's greatest period came to an end. Under the republic the power of Rome had been extended from Arabia to Great Britain, and from Spain to Armenia. See MITHRIDATES.

In 27 B. C. Octavian became first emperor of Rome under the title of AUGUSTUS (*q. v.*). His immediate successors added slightly to Roman territory, but under MARCUS AURELIUS (*q. v.*) the decline began. From A. D. 180 to 284 (see TRAJAN) Rome grew gradually weaker. In 284 DIOCLETIAN (*q. v.*) re-

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THE ROMAN FORUM

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THE COLISEUM, ROME, ITALY

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A CELEBRATION OF MASS FOR ITALIAN TROOPS IN THE INTERIOR OF THE COLISEUM

©Keystone View Company

THE SISTINE CHAPEL IN THE VATICAN, WITH MICHELANGELO'S MURAL PAINTING OF THE "LAST JUDGMENT"

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HALL OF THE IMMACULATE CONCEPTION, THE VATICAN, ROME, ITALY

©Keystone View Company

CASTLE ST. ANGELO AND BRIDGE OVER THE TIBER, ROME

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A BUSY CANAL IN THE CITY OF ROTTERDAM, IN THE NETHERLANDS

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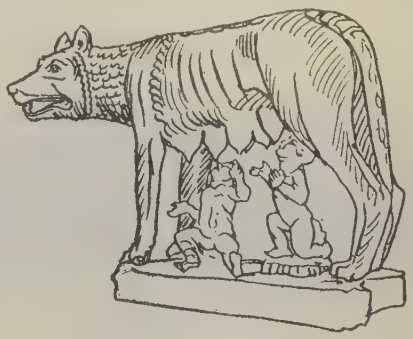
THE ROYAL GORGE, COLORADO

organized the empire, and for nearly 200 years these reforms delayed the inevitable disruption; but in 395 the empire separated into two divisions; the Eastern, or BYZANTINE (*q. v.*) and the Western; and in 476 the Western, or Roman empire was finally overthrown, and Odoacer, a German, became King of Italy. See ITALY: ROMANCE LANGUAGES.

ROME, the capital of Italy, as formerly of the Roman empire, republic, and kingdom, and long the religious center of Western Christendom, is one of the most ancient and interesting cities of the world. It stands on both sides of the Tiber, about 15 miles from the sea, the river here having a general direction from N. to S., but making two nearly equal bends, the upper of which incloses a large alluvial flat, little raised above the level of the stream, and well known by the ancient name of Campus Martius. A large part of the modern city stands on this flat, but the ancient city lay mostly to the E. and S. E. of this, occupying a series of eminences of small elevation known as the seven hills of Rome (the Capitoline, the Palatine, the Aventine, the Quirinal, the Viminal, the Esquiline, and the Cælian Hill), while a small portion stood on the other side of the river, embracing an eighth hill (Janiculum). The city is tolerably healthy during most of the year.

Ancient Rome, Topography, etc.—The streets of ancient Rome were crooked and narrow, the city having been rebuilt, after its destruction by the Gauls in 390 B. C., with great haste and without regard to regularity. The dwelling-houses were often very high, those of the poorer classes being in flats, as in modern continental towns. It was greatly improved by Augustus, who extended the limits of the city and embellished it with works of splendor. The Campus Martius during his reign was gradually covered with public buildings, temples, porticoes, theaters, etc. The general character of the city, however, remained much the same till after the fire that took place in Nero's reign, when the new streets were made both wide and straight. In the reign of Augustus the population is believed to have amounted to about 1,300,000, and in that of Trajan was not far short of 2,000,000. Rome is said to have been surrounded by walls at three different times. The first of these was ascribed to Romulus, and inclosed only the original city on the Palatine. The second wall, attributed to Servius Tullius, was 7 miles in circuit, and embraced all the hills that gave to Rome the name of the City of Seven Hills. The third wall is known as that of Aurelian, because it was begun and in great part finished by the emperor of that name. It is mostly the same with the wall that still bounds the city on the left or E. bank of the Tiber; but on the right or W. bank, the wall of Aurelian only embraced the summit of the Janiculum and a district between it and the river, whereas the more modern wall on that side (that of Urban VIII.) embraces also the Vatican Hill. The wall of Aurelian was about 11 miles in length, that of modern Rome 14 miles. Ancient Rome had eight or nine bridges across the Tiber, of which several still stand. The open spaces in ancient Rome, of which there were a great number, were distinguished into *campi*, areas covered with grass; *fora*, which were paved; and *areæ*, a term applied to open spaces



ROMULUS AND REMUS

generally, and hence to all those which were neither *campi* nor *fora*, such as the squares in front of palaces and temples. Of the *campi* the most celebrated was the Campus Martius already mentioned, and after it the Campus Esquilinus on the E. of the city. Among the latter the Forum Romanum, which lay N. W. and S. E. between the Capitoline and Palatine Hills; and the Forum of Trajan, between the Capitoline and Quirinal, are the most worthy of mention. The first was the most famous and the second the most splendid of them all. The great central street of the city was the Via Sacra (Sacred Way), which began in the space between the Esquiline and Cælian Hills, proceeded thence first S. W., then W., and then N. W., skirting the N. E. slope of the Palatine, and passing along the N. side of the Forum, and terminated at the base of the Capitoline. The two principal roads leading out of Rome were the Via Flaminia (Flaminian Way) or great N. road, and the Via Appia (Appian Way) or great S. road.

Ancient Buildings.—Ancient Rome was

adorned with a vast number of splendid buildings, including temples, palaces, public halls, theaters, amphitheaters, baths, porticoes, monuments, etc., of many of which we can now form only a very imperfect idea. The oldest and most sacred temple was that of Jupiter Capitolinus, on the Capitoline Hill. The Pantheon, a temple of various gods (now Church of S. Maria Rotonda), is still in excellent preservation. It is a great circular building with a dome roof of stone 140 feet wide and 140 feet high. Other temples were the Temple of Apollo, which Augustus built of white marble, on the Palatine, containing a splendid library, which served as a place of resort to the poets; the Temple of Minerva, which Pompey built in the Campus Martius, and which Augustus covered with bronze; the Temple of Peace, once the richest and most beautiful temple in Rome, built by Vespasian, in the Via Sacra, which contained the treasures of the temple of Jerusalem, a splendid library, and other curiosities, but was burned during the reign of Commodus; the temple of the Sun, which Aurelian erected to the E. of the Quirinal; and the magnificent temple of Venus, which Cæsar caused to be built to her as the origin of his family. The principal palace of ancient Rome was the Palatium or imperial palace, on the Palatine Hill, a private dwelling-house enlarged and adopted as the imperial residence by Augustus. Succeeding emperors extended and beautified it.

Nero built an immense palace which was burned in the great fire. He began to replace it by another of similar extent, which was not completed till the reign of Domitian. Among the theaters, those of Pompey, Cornelius Balbus, and Marcellus were the most celebrated. That of Pompey, in the Campus Martius, was capable of containing 40,000 persons. Of the Theater of Marcellus, completed 13 B. C., a portion still remains. The most magnificent of the amphitheaters was that of Titus, completed A. D. 80, now known as the Coliseum or Colosseum. Though only one-third of the gigantic structure remains, the ruins are still stupendous. The principal of the circuses was the Circus Maximus, between the Palatine and Aventine, which was capable of containing 260,000 spectators. With slight exception its walls have entirely disappeared, but its form is still distinctly traceable. The porticoes or colonnades, which were public places used for recreation or for the transaction of business, were numerous in the ancient city, as were also the basilicas or public halls. Among them may be noticed the splendid Basilica Julia, commenced by Cæsar and completed by Augustus; and the Basilica Porcia, which was built by Cato the censor.

The public baths or *thermæ* in Rome were also very numerous. The largest were the Thermæ of Titus, part of the substructure of which may still be seen on the Esquiline Hill; the Thermæ of Caracalla, even larger, extensive remains of which still exist in the S. E. of the city; and the Thermæ of Diocletian, the largest and most magnificent of all, part of which is converted into a church. Of the triumphal arches the most celebrated are those of Titus (A. D. 81), Severus (A. D. 203), and that of Constantine (A. D. 311), all in or near the Forum and all well preserved structures; that of Drusus (B. C. 8), in the Appian Way, much mutilated; that of Gallienus (A. D. 262) on the Esquiline Hill, in a degraded style of architecture. Among the columns the most beautiful was Trajan's Pillar in the Forum of Trajan, 147 feet in height, still standing. The bas-reliefs with which it is enriched, extending in spiral fashion from base to summit, represent the exploits of Trajan, and contain about 2,500 half and whole human figures. A flight of stairs within the pillar leads to the top. The most celebrated of ancient sewers is the Cloaca Maxima, ascribed to Tarquinius Priscus, a most substantial structure, the outlet of which is still to be seen.

The Roman aqueducts were formed by erecting one or several rows of arches superimposed on each other across a valley, and making the structure support a waterway or canal, and by piercing through hills which interrupted the watercourse. Some of them brought water from a distance of upward of 60 miles. Among others, the Aqua Paola, or Aqua Trajana, and the Aqua Marzia, still remain, and contribute to the supply of the city, and also its numerous important ornamental fountains. Among the magnificent sepulchral monuments, the chief were the mausoleum of Augustus in Campus Martius; and that of Hadrian, on the W. bank of the Tiber, now the fortress of modern Rome, and known as the Castle of St. Angelo. The catacombs of Rome are subterranean galleries which were used as burial places and meeting places, chiefly by the early Christians, and which extend under the city itself as well as the neighboring country. The chief are the catacombs of Calixtus, St. Prætextatus on the Via Appia; of St. Priscilla, 2 miles beyond the Porta Salora; of St. Agnese, outside the Porta Pia; of S. Sebastiano, beneath the church of that name, etc. See CATACOMBS.

Modern Rome.—It was not till the 17th century that the modern city was extended to its present limits on the right bank, by a wall built under the pontificates of Urban VIII. (1623–1644) and Innocent X. (1644–1655), and inclosing both the Janiculum and the Vatican hills. The boundary wall on the left or E. bank of the river follows the same line as that traced by Aurelian in the 3d century, and must in many parts be identical with the original structure. The walls on both banks are built of brick, with occasional portions of stone work, and on the outside are about 55 feet high. The greater part dates from A. D. 271 to 276. The city is entered by 12 gates (several of those of earlier date being now walled up) and several railway accesses. Since Rome became the capital of united Italy it has lost much of its ancient picturesque appearance, and has acquired the look of a great modern city with wide, straight streets of uniform-looking tenements having little distinctive character. The extensive excavations carried out have laid completely bare the remains of many of the grandest monuments of ancient Rome, notably the whole of Forum Romanum and the Via Sacra, the remains of the Temples of Saturn and of Castor and Pollux, the Temples of Vespasian, of Antoninus and Faustina, the Temple of Vesta, etc.

Streets, Squares, etc.—Among the principal streets and squares of modern Rome are the Piazza del Popolo immediately within the Porta del Popolo on the N. side of the city near the Tiber, with a fine Egyptian obelisk in its center, and two handsome churches in front, standing so far apart from each other and from the adjoining buildings as to leave room for the divergence of three principal streets, the Via di Ripetta, the Corso, and the Via del Babuino. The Corso stretches for upward of a mile in a direct line to its termination at the Piazza di Venezia, not far from the Capitol, and is the finest street in the city. The appearance of the Capitol has been entirely altered to permit the erection of a monument to Victor Emmanuel. The Via del Babuino proceeds first directly to the Piazza di Spagna, thence to the Quirinal, and by a tunnel opens out on the Esquiline. It contains a large number of handsome edifices. The whole of the city to the E. of this street, and in the triangular space included between it and the Corso, is well aired and healthy, and is regarded as the aristocratic quarter. The Ghetto, or Jews' quarter, was cleared away in 1889.

The chief open spaces besides the Piazza del Popolo are the Piazza S. Pietro, with its extensive colonnade; the Piazza Navona, adorned with two churches and three fountains, one at each extremity and the third in the center; the Piazza di Spagna, adorned by a monumental pillar and a magnificent staircase of travertine, leading to the Church of Trinità de' Monti, conspicuously seated on an eminence above it; the Piazza Barberini, beside the palace of the same name, adorned by a beautiful fountain; the Piazza Colonna, in the center of the city, with column of Marcus Aurelius; near it, in the Piazza di Monte Citoria, is the spacious Chamber of Deputies. Larger spaces for amusement or exercise have been formed only in a few spots. One of the finest is the Pincio, or "hill of gardens," overlooking the Piazza del Popolo, and commanding a fine view. It is a fashionable drive toward evening, and presents a gay and animated appearance. At a short distance outside the walls on the N. of the city is the Villa Borghese, forming a finely planted and richly decorated park of 3 miles in circuit, which, though private property, forms the true public park of Rome and is the favorite resort of all classes. Various localities in and near Rome that were malarious have been rendered healthy by planting eucalyptus trees.

Churches.—The most remarkable of these is the Cathedral of St. Peter, the largest and most imposing to be found anywhere. Another remarkable church is that of San Giovanni in Laterano, on an isolated spot near the S. wall of the city. It was built by Constantine the Great, destroyed by an earthquake in 896, re-erected (904–911), burned in 1308, restored and decorated by Giotto. Again burned in 1360, rebuilt by Urban V. and Gregory XI., and has undergone various alterations and additions from 1430 till the present façade was erected in 1734. A modern extension has involved the destruction of the ancient apse. From the central balcony the Pope pronounces his benediction on Ascension day, and the church is the scene of the councils which bear its name.

Other churches are those of Santa Maria Maggiore (434); Santa Croce; San Clement, containing a number of interesting frescoes by Masaccio; Il Gesu, the principal church of the Jesuits, with the façade and cupola by Giacomo della Porta (1577); and an interior enriched with the rarest marbles and several fine paintings, and containing the monument of Cardinal Bellarmine; Sta. Maria-delli-Angeli, originally a part of Diocletian's Baths, converted into a church by Michelangelo, one of the most imposing which Rome possesses, and containing an

altarpiece by Muziano, a fine fresco by Domenichino, and the tomb of Salvator Rosa; Sta. Maria in Ara Cœli, on the Capitoline, a very ancient church approached by a very long flight of stairs, remarkable for its architecture and for containing the figure of the infant Christ called the *santissimo bambino;* Sta. Maria in Cosmedin, at the N. base of the Aventine, remarkable for its fine Alexandrine pavement and its lofty and beautiful campanile of the 8th century; Sta. Maria sopra Minerva, so called from occupying the site of a temple of that goddess, begun in 1285 and restored 1848-1855, remarkable as the only Gothic church in Rome; Sta. Maria in Dominica or della Navicella, on the Cælian, is remarkable for 18 fine columns of granite and two of porphyry, and the frieze of the nave painted in camieau by Giulio Romano and Perino del Vago. Among other churches are Sta. Maria della Pace, celebrated for its paintings, particularly the four Sibyls, considered among the most perfect works of Raphael; Sta. Maria del Popolo, interesting from the number of its fine sculptures and paintings (Jonah by Raphael, ceiling frescoes by Pinturicchio, and mosaics from Raphael's cartoons by Aloisio della Pace); Sta. Maria in Trastevere, a very ancient church, first mentioned in 499 and San Paolo fuori le Mura.

Palaces, Picture Galleries, etc.—The Vatican, adjoining St. Peter's, comprises the old and new palaces of the Popes (the latter now the ordinary papal residence), the Sistine chapel, the Loggie and Stanze, containing some of the most important works of Raphael, the picture gallery, the museums (Pio-Clementino, Chiaramonti, Etruscan and Egyptian), and the library (220,000 volumes and over 25,000 MSS.). The palace of the Quirinal was formerly a favorite summer residence of the Popes, but is now occupied by the King of Italy. The Palazzo della Cancelleria is the only palace on the left bank of the river still occupied by the ecclesiastical authorities. The building was designed by Bramante, and is one of the finest in Rome. A series of palaces crowns the summit of the Capitol, and surrounds the Piazza del Campidoglio. It is approached from the N. W. by a flight of steps, at the foot of which two Egyptian lions, and at the summit two colossal statues of Castor and Pollux standing beside their horses, are conspicuous. In the center of the piazza is a bronze equestrian statue of Marcus Aurelius (161–181). On the S. E. side of the piazza is the Senatorial Palace, in which the senate holds its meetings. The building also contains the offices of the municipal administration and an observatory. Its façade was constructed by Giacomo della Porta, under the direction, it is said, of Michelangelo. On the S. W. side of the piazza is the palace of the Conservatori, containing a collection of antique sculpture, including objects of art discovered during the recent excavations, and a gallery of pictures. Opposite is the museum of the Capitol, with interesting objects of ancient sculpture and a picture gallery.

Among private palaces may be noted the Palazzo Barberini, on the Quirinal, with a collection of paintings. The library attached to it has numerous valuable MSS., with some other literary curiosities. The Palazzo Borghese, begun in 1590, has a fine court surrounded by lofty arcades, but is chiefly celebrated for its picture gallery, containing the Aldobrandi Marriage and some other works of great renown. The Palazzo Colonna has a picture gallery and a beautiful garden containing several remains of antiquity. The Palazzo Corsini has a picture gallery, garden, and collection of MSS. and printed books of great value. The Palazzo Farnese, one of the finest in Rome, was built under the direction of Antonio da Sangallo, Michelangelo, and Giacomo della Porta in succession. The celebrated antiquities it once contained (Farnese Bull, Hercules, Flora, etc.), are now in the Museum of Naples. The Palazzo Rospigliosi, erected in 1603, contains some valuable art treasures; among others, on the ceiling of a casino in the garden is the celebrated fresco of Aurora by Guido. Villa Ludovisi, situated in the N. of the city, the ancient gardens of Sallust, contains a valuable collection of ancient sculptures. Villa Farnesina, on the right bank, containing Raphael's charming creations illustrative of the myth of Cupid and Psyche.

Educational Institutions, Charities, etc.—Among educational institutions the first place is claimed by the university, founded in 1303. The most flourishing period of the university was the time of Leo X. (1513–1522), under whom the building still occupied by it was begun. Attached to the university are an anatomical and a chemical theater, and cabinets of physics, mineralogy, and zoölogy, as also botanic gardens, and an astronomical observatory. The university is attended by about 2,700 students. The Collegio Romano, formerly a Jesuit college, now contains the Archæological Museum and the recently established library, Biblioteca Vittorio Emanuele—consisting mostly of the old library of the Jesuits, augmented by the libraries of suppressed monasteries (about 500,-

000 volumes). The Collegio de Propaganda Fide has acquired great celebrity as the establishment where Roman Catholic missionaries are trained. The Accademia di San Luca, for the promotion of the fine arts, is composed of painters, sculptors, and architects, and was founded in 1577 and reorganized in 1874. Connected with it are a picture gallery and schools of the fine arts. Other associations and institutions connected with art, science, or learning are numerous; one of them, the Accademia de' Lincei, founded in 1603 by Galileo and his contemporaries, is the earliest scientific society of Italy. Besides the Vatican and Vittorio Emanuele libraries mentioned above, the chief are the Biblioteca Casanatense; the Biblioteca Angelica, and the Biblioteca Berberini. For elementary education much has been done since the papal rule came to an end. Hospitals and other charitable foundations are numerous. The chief theaters include the Teatro Apollo, Teatro Argentina, Teatro Valle, the Capranica, Metastasio, Rossini, and the Costanzi.

Trade and Manufactures—The external trade is unimportant, and is carried on chiefly by rail, the Tiber being navigated only by small craft. There are railway lines connecting with the general system of Italy; and steamers from Civita Vecchia to Naples, Leghorn, and Genoa. The chief manufactures are woolen and silk goods, artificial flowers, earthenware, jewelry, musical strings, mosaics, casts, and objects of art. The trade is chiefly in these articles, and in olive oil, pictures, and antiquities.

History.—The ancient history of Rome has already been given. From the downfall of the empire its history is mainly identified with that of the papacy. An important event in its history is its capture and sack by the troops of the Constable of Bourbon in 1527. In 1798 Rome was occupied by the French, who stripped the palaces, churches, and convents of many works of art and objects of value. Pope Pius VI. was taken prisoner to France, where he soon afterward died, and a Roman republic was set up. In 1848 Pope Pius IX. was driven from Rome, and another Roman republic formed under Mazzini and Garibaldi. A French army was sent to the Pope's assistance, and after a determined resistance Rome was captured by the French in July, 1849, and the Pope returned and resumed his power under the protection of French bayonets (April, 1850). The rule of the Pope continued till October, 1870, when Rome was occupied by the Italian troops on the downfall of the French empire, and in June, 1871, the "Eternal City" became the capital of united Italy. The king took up his residence in the Quirinal; and to accommodate the legislature and various public departments numerous conventual establishments were expropriated. The population of the city has of late vastly increased. In 1870 it was 226,022; in 1881, 276,463; in 1901, 424,860; and in 1920, about 534,000.

ROME, AMERICAN ACADEMY OF FINE ARTS IN, a division of the American Academy in Rome, a consolidation of the American School of Classical Studies in Rome, founded in 1895, and the American Academy of Fine Arts in Rome, originated in 1894 and formally organized and incorporated in 1897. The American Academy of Fine Arts in Rome was created as an institution to serve the national need for acquaintance with the classical sources and atmosphere. Begun under the impetus and inspiration of the World's Fair and supported by such men as McKim and Burnham, it soon became a vital force in the art world of America, receiving and training many of our best artists, architects, and sculptors at the Villa Aurora in Rome. In 1909 the Academy accepted the bequest of Mrs. Heyland, an American lady resident in Rome and long a generous patron of the society, and moved the school to the beautiful Villa Aurelia, a home of peculiar fitness for its work, both by equipment and location. Here it has continued its work, offering instruction and criticism to students in the more advanced fields of architecture, painting, landscape architecture, and sculpture. Annual fellowships of generous amount are offered by the Academy to American students of exceptional attainment and promise in the several divisions of art above mentioned, and the Academy has already made its influence apparent in the modern art world of America by the noteworthy accomplishments of its graduates.

ROME, AMERICAN COLLEGE IN, a Catholic institution in Rome, Italy, established in 1859, for the education of American ecclesiastics. The prime movers in the project were Archbishop Hughes of New York and Archbishop Kenrick of Baltimore, and the first president was the Rev. William George McCloskey, later Bishop of Louisville. The money required for the establishment and conduct of the college was mainly contributed from the United States, though Pope Pius IX. bought and presented to the American bishops as the nucleus of the foundation the old Visitation Convent of the Umilta, then occupied by the soldiers of the French garrison in Rome. The college was formally

opened with thirteen students who had for some time been waiting in the College of the Propaganda for the event. The first ordination of an alumnus was in 1862, in the Church of St. John Lateran by Cardinal Patuzzi. During the Vatican Council the American prelates in Rome decided that the property of the college should remain in the hands of the Sacred Congregation of Propaganda. There are thirty-five purses or scholarships founded in the colleges. The number of students is about one hundred and forty. In 1884 the college was exempted from the effect of the Italian statutes of confiscation.

ROME, UNIVERSITY OF, a government educational institution situated in Rome, Italy, and now known as the Royal University. In former times it was known as the Studium Urbis. The University of Rome was founded at the beginning of the 14th century by Pope Boniface VIII. During the political and social upheavals which accompanied the Great Schism and so violently affected the more temporal aspects of the Church of Rome, the University ceased for a time to exist. It was revived and reorganized under its former name by Eugenius IV. in 1431. From then on it maintained its existence as a papal institution until the year 1870, when in the political upheaval of that period, it was brought under the control of the Italian Government. The Royal University has a registration of between four and five thousand students. Although handicapped, as other educational institutions have been by the recent World War, it has continued to carry on its activities in the several schools of engineering, pharmacy, agriculture, diplomacy, philosophy, science, medicine, and law. Its manuscript, pamphlet, and book collections, known as the Biblioteca Alessandrina, have been credited with about 250,000 volumes.

ROMNEY, GEORGE, an English painter; born in Reckside, Lancashire, Dec. 26, 1734. He was the son of a carpenter, and at first worked at his father's trade, but he afterward was apprenticed to an itinerant artist named Steele, and at the age of 23 began the career of a painter. After a certain amount of local success he went to London in 1762, and next year won a prize offered by the Society of Art for a historical composition. He steadily rose in popularity, and was finally recognized as inferior only to Reynolds and Gainsborough as a portrait painter; some critics even placed him higher than either. His residence in London was interrupted by occasional visits to the Continent for purposes of study, and his most prosperous period dates from 1775, after his return from a visit of 18 months to Rome. Many distinguished Englishmen and many ladies of rank sat to him for their portraits; but perhaps the most beautiful of his sitters was Emma Hart, afterward Lady Hamilton, whom he depicted in very numerous character. He did not neglect historical or imaginative compositions, and he contributed several pictures to Boydell's famous Shakespeare gallery, founded in 1786. His health began to fail in 1797, and in 1799 he rejoined his wife (married in 1756), who throughout his whole London career had remained at Kendal. Romney displays a want of carefulness, and defective knowledge of anatomy in his historical compositions; but he atones for these faults by fine color, a subtle sense of beauty, and by his originality. Fine examples of his work command high prices. He died in Kendal, Nov. 15, 1802.

ROMULUS, mythical founder and first King of Rome. According to the legends, he was the son of the vestal Rhea Sylvia by the god Mars, Sylvia being a daughter of Numitor, rightful heir of the King of Alba, but deprived by his brother. Exposed with his twin brother Remus, the babes were suckled by a she wolf, and afterward brought up by a shepherd. Their parentage was discovered, and they determined to found a city on the banks of the Tiber, the scene of their exposure. The right to choose the site was acquired by Romulus; and Remus not acquiescing, in his disappointment, was slain. Inhabitants for the new city were found by establishing a refuge for murderers and fugitive slaves on the Capitoline hills, and by carrying off the Sabine maidens at a feast to which they were invited. This led to war with the Sabines, which ended, through the intervention of the Sabine women, in a union of Romans and Sabines, under their two kings, Romulus and Titus Tatius. The latter was soon slain, and Romulus reigned alone. He was regarded as the author of the fundamental division of the people into *tribes*, *curiæ*, and *gentes*, and of the institution of the senate and the *comitia curiata*. The date commonly assigned for the foundation of Rome is 753 B. C.

The tomb in which the body of Romulus is alleged to have been interred was discovered in January, 1899, in the Roman Forum, near the arch of Septimus Severus, along the Via Sacra. A large slab of black marble, measuring four square meters, was found, exactly cor-

responding to the description of the tomb of Romulus alluded to by Varro as "Lapis Niger." This stone differs from ordinary Roman silicium, and comes from Cape Tenarium, in Greece, thus proving that communication existed between Rome and Greece in the most remote period. For many centuries, till the fall of the Roman empire, the tomb of Romulus was considered a sacred shrine by the Romans. The discovery is incalculably valuable to historians and archæologists, proving the fact, often doubted and ridiculed, especially by the German school, that a black stone, surrounded by a marble inclosure one meter high, was missing from the E. side of the Rostra Julia.

RONA, an island with a lighthouse in the Inner Hebrides, between Skye and the mainland of Scotland, 4¾ miles long, 1 broad. It is extremely barren and of unattractive aspect. Also the name of a small island with remains of an ancient oratory, 44 miles N. E. of the Butt of Lewis.

RONDEAU, or **RONDO**, a kind of poetry which returns, as it were, to the same point, or in which part is repeated, thus containing a refrain. In French poetry, the rondeau is a little composition of 13 verses, divided into three unequal strophes, with two rhymes (five lines masculine and five feminine, or *vice versa*). The first two or three words of the first verse serve as the burden, and recur in that shape after the 8th and 13th verses. There are also double rondeaux and single rondeaux; the latter an obsolete but easier kind of verse. In music, a light form of composition, in which the subject or theme returns frequently; it usually forms the last movement of a symphony or sonata.

RONSARD, PIERRE DE, a French poet; born in Vendomois, France, Sept. 11, 1524. At the age of 12 he became page to the Duc d'Orleans; and in 1537 he accompanied James V. of Scotland and his bride, Madeleine of France, back to their kingdom. He also spent six months at the English court, and after his return to France in 1540 was employed in a diplomatic capacity in Germany, Piedmont, Flanders, and Scotland. He was compelled, however, by deafness to abandon the diplomatic career; and he devoted himself to literary studies and became the chief of the band of seven poets afterward known as the "Pléiade." Ronsard's popularity and prosperity during his life were very great. Henry II., Francis II., and Charles IX. esteemed him, and the last bestowed several abbacies and priories on the poet. His writings consist of sonnets, odes, hymns, eclogues, elegies, satires, and a fragment of an epic poem, "La Franciade." He died at Tours, in December, 1585.

ROOD, a cross or crucifix; specifically, a representation of the crucified Saviour, or, more generally, of the Trinity, placed in Catholic churches over the altar screen. hence termed the rood screen. The cross displayed the three persons of the Trinity, the Son being represented as crucified. Generally figures of the Virgin and St. John were placed at a slight distance on each side of the principal group, in reference to John xix: 26. See ROD.

ROOD, HENRY, an essayist and editor, born in Philadelphia, 1867. From 1900 to 1910 he was assistant editor of "Harper's Magazine." He contributed short stories and essays on literary and economic topics to many of the leading magazines and was special correspondent for the New York "Sun," "Times," "Herald," and "Evening Post." He wrote, together with Colonel W. H. Crook, "Memories of the White House" (1911).

ROOF, the external covering on the top of a building; sometimes of stone, but usually of wood overlaid with slates, tiles, lead, etc. The form and construction of the timber work of roofs differ materially according to the nature of the building on which it is to be placed, and any attempt to notice all the varieties would far exceed the limits of this work. The main parts of the framing, which in most cases are placed at regular intervals, are each called a truss, principal, or pair of principals; these, in ornamental open roofs, are the leading features, and in some ancient roofs are contrived with an especial view to appearance. A king-post roof has one vertical post in each truss, a queen-post roof has two. Since the introduction of iron in the construction of roofs, spaces of almost any width can be roofed over. Also that which resembles, or corresponds with, the cover of a building; as, the roof of the mouth, the roof of the firmament, etc.

ROOF OF THE WORLD, the Pamirs; an extensive table-land of Central Asia, so named by its natives. A part of the plateau is said to be 15,000 feet above the sea.

ROOK, a European species of crow (*Corvus frugilegus*, Linn.), resembling in size and color the carrion crow, but differing in having the base of the bill whitish and scurfy, and bare of feathers. The rook is gregarious at all seasons, resorting constantly to the same trees

every spring to breed. After their young have taken wing, they all forsake their nest trees, returning to them again in October to roost; but as winter comes on, they generally select more sheltered places at night nearby, to which they fly off together.

ROONEY, JOHN JEROME, an American jurist and writer, born in Binghamton, N. Y., in 1866. He was educated at Mt. St. Mary's College, Maryland. After five years' service on the editorial staff of the Philadelphia "Record," he was admitted to the New York bar. In 1813 he became presiding judge of the N. Y. State Court of Claims. He was a member of several legal and Irish-American societies, as well as of the Poetry Society of America. He wrote occasional verses, the best known of which was, "The Man Behind the Guns," written during the Spanish-American War, and later published in book form under that title.

ROOSEVELT, a borough of Middlesex co., N. J. It has a frontage on Staten Island Sound, and on the Rahway river, and is on the Central of New Jersey railroad. It was formed in 1906 by the consolidation of three districts. It is an important industrial city and has manufactures of steel, fertilizers, metal goods, cigars, paints, etc. Pop. (1910) 5,786; (1920) 11,047.

ROOSEVELT, FRANKLIN DELANO, an American public official, born at Hyde Park, Dutchess co., N. Y., in 1882, a distant relative of Theodore Roosevelt. He graduated from Harvard University in 1904 and studied at the Columbia University Law School from 1904 to 1907. He was admitted to the bar in the latter year and began practice with the firm of Carter, Ledyard & Milburn, of New York City. He remained in this connection until 1910, when he became a member of the firm of Marvin, Hooker & Roosevelt. He was elected to the State Senate in 1910, but resigned in 1913 on his appointment as assistant secretary of the navy. In 1918 he was in charge of the inspection of the United States naval forces in European waters and in 1919 had general charge of demobilization of naval forces in Europe. During the World War he carried on his important duties with the Navy Department with great energy, and, in general, escaped the criticism which was lodged against other high officials of that department. Although he had not hitherto been conspicuous in partisan politics, he was chosen Democratic candidate for vice-president at the Democratic National Convention, in July, 1920. Following his nomination he took a vigorous part in the campaign and made speeches in all parts of the country, but chiefly in the Middle and Far West.

ROOSEVELT, KERMIT, an American writer, born in Oyster Bay, N. Y., in 1889, the second son of THEODORE ROOSEVELT (*q. v.*). He was educated at Harvard University in 1909, and in 1910 he accompanied his father on a hunting trip to Africa, being also his companion on his South American trip in 1914. From 1911 to 1916 he was engaged in engineering and banking enterprises in South America. During the World War he served as captain in the British army in Mesopotamia, being transferred to the 7th artillery, first division, United States Army, in June, 1918. He was honorably discharged in March, 1919, and received the British Military Cross and the Montenegrin War Cross. After the war he was for some time secretary of the American Ship and Commerce Corporation and of the Kerr Navigation Corporation. He wrote "War in the Garden of Eden" (1919).

ROOSEVELT, QUENTIN, an American aviator, youngest son of Theodore

QUENTIN ROOSEVELT

Roosevelt (*q. v.*), born at Oyster Bay, N. Y., in 1897. At the entrance of the

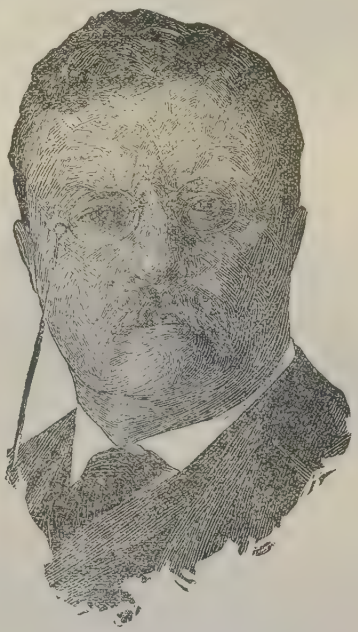
United States into the World War he at once enlisted in the aviation service and, after training, was assigned to the American Air Force in France. On July 14, 1918, he was flying with an American squadron, when it was suddenly attacked by German aeroplanes. A struggle ensued which culminated in a duel between Lieutenant Roosevelt and a German noncommissioned officer. The latter succeeded in so injuring Lieutenant Roosevelt's machine that it fell near the village of Chamery, about six miles north of the Marne. Lieutenant Roosevelt was found to have been shot through the head. He was buried with military honors by the German airmen and in 1920 the area in which his body lay was given to Mrs. Theodore Roosevelt by the French Government.

ROOSEVELT, ROBERT BARNWELL, an American lawyer; born in New York City, Aug. 7, 1829. He was an enthusiastic sportsman, and published: "The Game Fish of North America" (1860); "The Game Birds of the North" (1866); "Superior Fishing" (1866); "Florida and the Game Water Birds" (1868); "Five Acres Too Much" (1869), a satire provoked by Edmund Morris's "Ten Acres Enough"; and "Progressive Petticoats," a satire on female physicians. He died June 14, 1906.

ROOSEVELT, THEODORE, an American statesman, historian, essayist, publicist, naturalist, explorer, civil and political reformer, soldier, 26th president of the United States. Born, New York City, Oct. 27, 1858; was graduated from Harvard University 1880, and was subsequently the recipient of many honorary degrees from American and European universities. During early life Roosevelt was frail, but succeeded in building up a strong physical constitution by exercise and open air life.

After graduation he engaged in the study of law, but abandoned the pursuit to become a member of the New York State Legislature, 1882-84, representing the 21st Assembly District of New York. The key to his later attitude as a reformer will be found in his indignation over the decision of the Court of Appeals that a law he had fathered in favor of public health by prohibiting the manufacture and the preparation of tobacco in tenement-houses was declared unconstitutional.

He was a delegate to the Republican National Convention, 1884, and during the campaign supported James G. Blaine. From 1884-86 he lived on a ranch in North Dakota, which gave the background for his subsequent writings on life in the far west. In 1886 he was defeated for the mayoralty of New York City by Abram F. Hewitt. Upon appointment by President Benjamin Harrison, Roosevelt became a member of the United States Civil Service Commission serving 1889-95. Into this work he threw great enthusiasm, and forced the question of civil service reform upon Congress and the American people. He resigned in 1895 to become President of the Board of Police Commissioners for the City of New York, in which position he probably made himself



THEODORE ROOSEVELT

more felt than any other official in the history of the city.

At the request of President McKinley in 1897 he resigned to become Assistant Secretary of the Navy under John D. Long of Massachusetts. Foreseeing that war with Spain was inevitable, he insisted on putting the United States fleet in preparation for instant action. When the war with Spain came he resigned his naval position, May 6, 1898, and entered the military service as Lieutenant Colonel, First United States Cavalry Volunteers, known subsequently as the "Rough Riders." He was in command of his regiment in the fight at San Juan Hill, was commended for gallantry and promoted to be Colonel.

In November, 1898, Roosevelt was elected Governor of the State of New York. During his incumbency he fought strenuously against boss control and for

the many measures he had advocated while United States Civil Service Commissioner.

The Republican National Convention in Philadelphia, 1900, nominated him for the Vice-Presidency on the McKinley ticket, a candidacy which Roosevelt was very reluctant to accept. President McKinley was assassinated on Sept. 14, 1901, and Roosevelt succeeded to the Presidency at the age of 43. During his term of office he fulfilled his promise and adhered strictly to the Republican platform and principles as enunciated by McKinley during the campaign, and retained the Cabinet which McKinley had chosen. One of his outstanding acts was to appoint the Anthracite Strike Arbitration Commission, which brought about peace in the anthracite coal regions for many subsequent years.

The Republican National Convention at Chicago in 1904 unanimously nominated Roosevelt for the Presidency, and he received 7,623,486 popular votes and 336 electoral votes to 5,077,970 popular votes and 140 electoral college votes given for the Democratic candidate, Alton B. Parker. During his presidency Roosevelt endeavored to regulate the influence of large corporations without destroying their equities. He resisted the German Kaiser and brought about the submission of the Moroccan dispute to a conference of the Powers of Algeciras. Evidence has come to light that both Roosevelt and his Secretary, John Hay, were well aware at that time of the plans of the German Emperor for universal dominion, and they succeeded in frustrating those plans so far as American interests were concerned, and particularly in relation to China. Through Roosevelt's influence in 1905 Russia was persuaded to come to terms with Japan and thus close the costly Russo-Japanese War, for which he received the Nobel Prize in 1906. Throughout his administration Roosevelt's chief domestic policy was the conservation of natural resources. The most conspicuous and spectacular of Roosevelt's acts as President was the recognition of the new republic of Panama which led to the subsequent completion of the Panama Canal.

Upon the expiration of his term Roosevelt went immediately on a big game hunting excursion through Central Africa. From 1909-14 he was contributing editor of the "Outlook," in which journal he commented on national and international affairs. In 1910 he was special ambassador of the United States at the funeral of King Edward VII.

Upon his return from Africa and Europe Roosevelt became convinced that the Republican Party was falling into the hands of reactionaries. The Republican National Convention, Chicago, 1912, brought on a crisis in which the Liberal or Progressive Republicans demanded Roosevelt's nomination. There was bitter dispute over the seating of certain delegates, but William H. Taft was nominated for the presidency. Owing to a belief that certain rulings of the Chairman were unparliamentary, the Progressive Republicans felt that they were not bound by the vote. This gave birth to what was known as the Progressive or Bull Moose Party, which six weeks later met in Chicago and nominated Roosevelt for the presidency on a new party ticket. The platform adopted stressed many of the liberal doctrines which Roosevelt had advocated during his career and some to which he gave personally only reluctant assent. The chief planks in the platform were direct primaries, conservation of natural resources, woman suffrage, the initiative, the referendum and the recall of judicial decisions. Woodrow Wilson, Governor of New Jersey, was nominated by the Democratic Party which resulted in an intensely bitter three-cornered fight. At the election on Nov. 5, Wilson was elected by 6,286,000 votes out of 15,310,000. Roosevelt received 4,126,000 and Taft 3,483,000.

Although many of the Progressives felt that they had formed a new permanent political party, Roosevelt did not share their views, for in 1916 he gave his unqualified support to Charles E. Hughes, the Republican candidate for the presidency. In 1913 Roosevelt went to South America where he delivered a series of addresses, and in 1914 explored a tributary of the Madeira river, in Brazil, for a distance of 600 miles. Fever contracted during this expedition led to physical troubles which finally ended in death. The year 1915 is memorable in his life because of a law-suit brought against him by William Barnes, Jr., of Albany, N. Y., charging Roosevelt with libel. The verdict was in favor of the defendant.

The Progressive Party in 1916 nominated Roosevelt for the presidency which he declined almost immediately, in order to throw his personal influence in favor of Hughes against Wilson.

During the World War, 1914-18, Roosevelt spoke and wrote incessantly on the duty of America to take a more positive stand in the conflict. He offered to raise and equip an army division or several divisions and lead them to France in 1917, but the offer was declined by President Wilson.

Roosevelt died unexpectedly Jan. 6, 1919. Since his death all partisan feeling toward him has passed away, and he is now recognized as one of the greatest leaders of the United States, certainly

the most versatile man America has produced. He was apparently impulsive in his utterances, but when his conclusions were examined, almost invariably they were found to rest upon sound erudition and had been reached by sustained and consecutive thought. His reading was unusually extensive, and his personal friendship with statesmen, scientists and eminent thinkers and writers of many lands made him familiar with the best and most advanced contemporaneous thought of the world.

Besides a multitude of magazine and newspaper articles he wrote the following volumes: "Winning of the West" (1889-96); "History of the Naval War of 1812" (1882); "Hunting Trips of a Ranchman" (1885); "Life of Thomas Hart Benton" (1886); "Life of Gouverneur Morris" (1887); "Ranch Life and Hunting Trail" (1888); "History of New York" (1890); "The Wilderness Hunter" (1893); "American Ideals and Other Essays" (1897); "The Rough Riders" (1899); "Life of Oliver Cromwell" (1900); "The Strenuous Life" (1900); "Works" (8 Vols., 1902); "The Deer Family" (1902); "Outdoor Pastimes of an American Hunter" (1906); "Good Hunting" (1907); "True Americanism"; "African and European Addresses" (1910); "African Game Trails" (1910); "The New Nationalism" (1910); "Realizable Ideals" (the Earl lectures, 1912); "Conservation of Womanhood and Childhood" (1912); "History as Literature, and Other Essays" (1913); "Theodore Roosevelt, an Autobiography" (1913); "Life Histories of African Game Animals" (2 vols., 1914); "Through the Brazilian Wilderness" (1914); "America and the World War" (1915); "A Booklover's Holidays in the Open" (1916); "Fear God, and Take Your Own Part" (1916); "Foes of Our Own Household" (1917); "National Strength and International Duty" (Stafford Little Lectures, Princeton Univ., 1917); "Theodore Roosevelt's Letters to His Children" (1919).

ROOSEVELT, THEODORE, an American military officer and public official, born in Oyster Bay, N. Y., in 1887, oldest son of Theodore Roosevelt (*q. v.*). He graduated from Harvard University in 1908, receiving an honorary degree of M.A. in 1919. After leaving college he engaged in business. Upon the entrance of the United States into the World War, he volunteered, being commissioned major of the 26th infantry on April 20, 1917, and being promoted lieutenant-colonel in September, 1918. He saw service in France from June, 1917, to the end of the war, participating in the battles at Cantigny, Soissons, and in the Argonne-Meuse and the St. Mihiel offensives. He was wounded and received the Legion of Honor and the Croix de Guerre. He was an organizer of the American Legion, a member of the National Executive Committee of the Boy Scouts of America,

THEODORE ROOSEVELT

and trustee of the American Museum of Natural History, New York. In November, 1919, he was elected to the New York State Assembly, and was elected again in November, 1920. He wrote "Average Americans" (1919). He was nominated Assistant Secretary of the Navy on March 7, 1921, by President Harding, and confirmed March 9th.

ROOT, in anatomy, that part of any organ or appendage of the body which is buried in another part. Thus the root of a nail is the portion covered by the skin; the root of a tooth, the base of it which is lodged in a socket.

In astronomy, the moment from which one begins to calculate the time of revolution of a planet.

In botany, the radix or descending axis of a plant. The roots of dicotyledons are exorhizal, those of monocotyledons endorhizal, and those of acotyledons heterorhizal. A root has no perfect bark, true pith, medullary sheath, or true leaves, and only a thin epidermis, a few stomata, and very rarely leafbuds. Its growth is

chiefly at the lower extremity. The body of a root is called the caudex, its minute sub-divisions the fibrils or radicles, and their ends the spongioles. A primary root is one formed by the downward elongation of the axis of the embryo, and is therefore in a line with the stem; secondary or lateral roots, like those of ivy, spring laterally from the stem and from the primary root. When the primary root is thicker than the branches which proceed from it, it is called a tap root, when it is no thicker than its ramifications, which conceal it from view, the root is said to be fibrous. Other forms of roots are conical, fusiform, napiform, rotund, nodose or coralline, moniliform, tuberose, or (finally) premorse. Most roots are terrestrial, a few are aërial, and a few aquatic. The chief functions of the root are to anchor the plant firmly in the ground, and to transmit upward to the stem and leaves absorbed nutriment from the soil. Roots require air, and in some cases in gardens obtain it by pushing their way into old drains.

In hydraulic engineering, the end of a weir or dam where it unites with the natural bank. In mathematics, the root of a quantity is any quantity which, being taken a certain number of times as a factor, will produce the quantity (see SQUARE ROOT). A root of a quantity may be real, or it may be imaginary. The character used to denote a root is $\sqrt{}$, called the radical sign. In music: (1) A note which, besides its own sound, gives overtones or harmonics. (2) That note from among whose overtones any chord may be selected. (3) Sometimes used by modern musicians as describing a note on which, when either expressed or implied, a chord is built up. In philology, an elementary notional syllable; that part of a word which conveys its essential meaning as distinguished from the formative parts by which this meaning is modified.

ROOT, ELIHU, an American lawyer and statesman, born in Clinton, N. Y., 1845. He studied at Hamilton College, of whose faculty his father was a member, then attended New York University Law School, being admitted to the bar in 1867. His first public office was that of United States District Attorney for the Southern District of New York, which he held in 1883. In that same year he was a delegate at large to the New York State Constitutional Convention, where he was appointed chairman of the judiciary committee. In 1899 he was appointed Secretary of War by President McKinley, and again in 1901. During this period, covering the Spanish-American War and the Filipino insurrection, he performed remarkable work in harmonizing the regular army and the state militia forces. It was at his initiative that the General Staff was created. In 1904 he again took up private law practice, but in the following year succeeded John Hay as Secretary of State. In 1909 he went to Washington as Senator from New York, but declined to serve further as such in

ELIHU ROOT

1913. In 1910 he was made a permanent member of the International Court of Arbitration at the Hague, since which he has been prominently identified with the movement toward international peace. In 1912 he was awarded the Nobel prize. In 1917 he was sent as special commissioner to represent President Wilson to the Provisional Government of the new Russian Republic, but was not well received there on account of his well known antipathy toward Socialistic ideas. During 1920, when it became apparent that the United States would not become a member of the League of Nations, Mr. Root devoted his attention to drafting alternative proposals in the form of an international legislative body which would be less centralized than the League. Mr. Root was generally considered one of the keenest American diplomats and experts on international law.

ROOT, GEORGE FREDERICK, an American musician and song-writer; born in Sheffield, Mass., Aug. 30, 1820. His first song, "Hazel Dell" (1853), was very popular. It appeared as the work of "Wurzel," the German name for "Root," a pseudonym he often used later. Among the most popular of his songs are: "Rosalie, the Prairie Flower" (1855); "Shouting the Battle Cry of Freedom" (1861); "Just Before the Battle, Mother" (1863); "Tramp, Tramp, Tramp, the Boys are Marching" (1864); and the well-known quartet, "There's Music in the Air." His cantatas include "The Flower Queen" (1852) and "The Haymakers" (1857). He did much to elevate the standard of music in the United States, and also published methods for the piano and organ, handbooks on harmony and teaching, etc. He died Aug. 6, 1895.

ROPE, a large, stout, twisted cord of hemp, of not less, generally, than an inch in circumference. A certain proportion of hemp twisted together forms a yarn, and a number of yarns form a strand. Three strands twisted together form a rope. Rope is either white or tarred, the latter being the best if liable to exposure to wet, the former if not exposed. The strength of tarred rope is, however, only about three-fourths that of white rope, and its loss of strength increases with time. Rope is designated by its circumference, expressed in inches, and is issued in coils of 113 fathoms each; marline and hambroline in skeins, spunyarn in pounds; the latter is made from old rope (junk). Government rope is distinguished by a colored thread, red, blue, or yellow, which runs through it. Rope used in the artillery service is coiled with the sun, *i. e.*, from left to right, in which direction the yarns are twisted so as to avoid kinking. Coir rope, which comes from Ceylon and the Maldive Islands, is made from the fibrous husk of the cocoanut. Manila rope from the fibers of a species of wild banana. Wire rope, both iron and steel, is also employed; on shipboard, particularly, to a considerable extent.

ROPER, DANIEL CALHOUN, an American public official, born in Marlboro co., S. C., in 1867. He was educated at Trinity College, N. C., and at the National University, Washington, D. C. From 1892 to 1894 he was a member of the S. C. House of Representatives, from 1894 to 1897 clerk of the United States Senate Committee on Interstate Commerce; from 1900 to 1910 expert special agent, United States Census Bureau; from 1910 to 1913 clerk of the Ways and Means Committee, United States House of Representatives; and from 1913 to 1916 first assistant postmaster general. He took active part in President Wilson's election campaign in 1916, was vice-chairman of the United States Tariff Commission from March to September, 1917, when he became commissioner of internal revenue. He greatly improved the collection of cotton statistics, originated the publication of the series of reports on cotton supply, and made a systematic study on behalf of the government of domestic and foreign textile industries. He wrote the "United States Post Office" (1917).

ROPES, JOHN CODMAN, an American historian; born in St. Petersburg, Russia, April 28, 1836; was graduated at Harvard in 1857; studied at the Harvard law school, and was admitted to the bar in 1861. Largely through his influence the United States Government began the collection and preservation of information relating to the Civil War, and he organized the Military Historical Society of Massachusetts. Besides contributions to this society and to periodicals, he wrote: "The Army under Pope" (1881); "The First Napoleon" (1885); "The Campaign of Waterloo"; "Atlas of Waterloo"; and "The Story of the Civil War." He died in Boston, Mass., Oct. 28, 1899.

RORAIMA, a celebrated mountain in South America, where the boundaries of British Guiana, Venezuela, and Brazil meet, 8,580 feet high, flat-topped, with steep, rocky sides, rendering the summit almost inaccessible.

RORER, SARAH TYSON, an American domestic economist and writer, born at Richboro, Pa. She was educated at the East Aurora Academy, and in 1871 married W. Albert Rorer. She was for 33 years lecturer on food, health, and disease, and a writer on domestic science. From 1886 to 1892 she was editor and part owner of "Table Talk," and from 1893 to 1897 was the editor of "Household News." From 1897 to 1911 she was on the staff of the "Ladies' Home Journal," and from the latter date devoted all her time to lecturing on domestic science. She was the author of many books on cookery which obtained a wide sale and popularity.

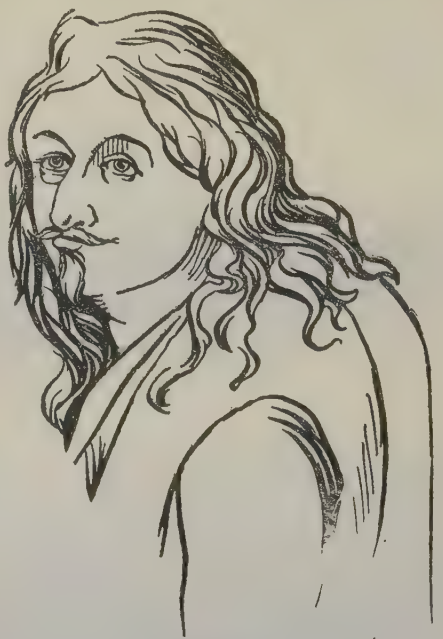
RORQUAL, the name given to certain whales, closely allied to the common or whalebone whales, but distinguished by having a dorsal fin, with the throat and under parts wrinkled with deep longitudinal folds, which are supposed to be susceptible of great dilatations, but the use of which is as yet unknown. Two or three species are known, but they are rather avoided on account of their ferocity, the

shortness and coarseness of their baleen or whalebone, and the small quantity of oil they produce. The N. rorqual (*Balænoptera boops*) attains a great size, being found from 80 to over 100 feet in length, and is thus the largest living animal known. The rorqual feeds on cod, herring, pilchards, and other fish, in pursuing which it is not seldom stranded on the shore.

ROSA, CARL AUGUST NICHOLAS, originally ROSE, a German opera manager and violinist; born in Hamburg, Germany, March 22, 1842. He was educated at the Leipsic Conservatory for a violinist, and appeared at the Crystal Palace in London, March 10, 1866. He soon came to the United States, where during a concert tour he met and married (in New York, in February, 1867) Mme. Parepa; formed an opera company, including Mme. Parepa-Rosa, Wachtel, Santley, Ronconi, and Formes, traveling as far as California. After his wife's death (1874), he organized in London an English opera company with which he produced nearly a score of popular operas not previously given in English. He died in Paris, France, April 30, 1889. See PAREPA-ROSA.

ROSA, MONTE, a mountain or group of the Pennine Alps, on the frontiers of the Swiss canton of Valais and Piedmont, and forming part of the watershed between the Rhône and the Po. Next to Mont Blanc it is the highest mountain in the Alps, but as a group it is much more massive than the Mont Blanc group. It has eight summits above 14,000 feet, the highest being Dufourspitze (15,217), ascended for the first time in 1855. Of the huge glaciers that occupy the slopes of this mountain the chief are the Görner Glacier on the W., the Schwarzberg and Findelen Glaciers on the N., the Sesia and Macugnaga Glaciers on the E., and the Lys Glacier on the S.

ROSA, SALVATOR, an Italian painter, etcher and poet; born near Naples, Italy, June 20, 1615. He received instruction in art from his brother-in-law, Francesco Fracanzaro, a pupil of Ribera, but his taste and skill were more influenced by his studies of nature on the Neapolitan coast. Rosa's father, dying in 1632, left his family in difficulties, and Salvator was compelled to sell his landscapes for small sums. One of his pictures fell into the hands of the painter Lanfranco, who at once recognized the genius of the youth and encouraged him to go to Rome. In 1638 Rosa settled in Rome, where he soon established his reputation and rose to fame and wealth. The bitterness of his satire, expressed both in his satirical poems and in an allegorical painting of the "Wheel of Fortune" rendered his stay in Rome inadvisable. He therefore accepted an invitation to Florence (1642), where he remained nearly nine years under the protection of the Medici. He finally returned to Rome. Salvator Rosa



SALVATOR ROSA

delighted in romantic landscape, delineating scenes of gloomy grandeur and bold magnificence. He also painted battle scenes, and latterly historical pictures. His poems were all satires, vigorous enough and pungent; among them are "Babylon" (*i. e., Rome*), "Music," "Poetry," "Painting," "War," and "Envy." Rosa etched from his own works with great skill. He died in Rome, Italy, March 15, 1673.

ROSACEA, ACNE ROSACEA, or **GUTTA ROSEA,** an affection which appears on the face, especially the nose, forehead, cheeks, and skin, characterized by an intense reddening of the skin without swelling. Persons who indulge in alcohol to excess are liable to it.

ROSACEÆ, roseworts; an order of plants placed by Lindley under his Rosal Alliance. Calyx four or five-lobed, free or adhering to the ovary; petals five, perigynous, equal; stamens indefinite, rising from the calyx just within the petals, curving inward in æstivation; ovaries several or only one; ovules two or more, generally suspended; fruit either one-seeded

nuts or acini, or several-seeded follicles; the leaves are simple or compound, generally with two stipules. Herbaceous plants or shrubs. The *rosaceæ* are closely akin to the *pomaceæ*, the *drupaceæ*, the *sanguisorbeæ*, and some other orders. They are divided by Lindley into five families or tribes, *rosidæ*, *potentillidæ*, *spiræidæ*, *quillaiæ*, and *neuradeæ*. The *rosaceæ* occur chiefly in the temperate and cold parts of the Northern Hemisphere; when they occur in the tropics it is generally on high land. They are in general astringent, and have been regarded as febrifuges. A recent estimate gives 90 genera and 1,500 species.

ROSAMOND, commonly called FAIR ROSAMOND, the mistress of Henry II. of England. She was the daughter of Walter de Clifford, a knight of property in various shires. Almost everything else related to Rosamond is legendary. The fable of the dagger and poison with which the jealous Queen Eleanor is said to have sought out her rival has not been traced higher than a ballad of 1611. She died in 1176 or 1177, and was buried in the Church of Godstow Nunnery, whence, however, Hugh of Lincoln caused her body to be removed in 1191.

ROSANILINE, in chemistry,

$$C_{20}H_{19}N_3 = \frac{H_2N\cdot C_6H_4}{H_2N\cdot C_6H_4} > C < \begin{matrix} C_6H_9\cdot CH_3. \\ NH. \end{matrix}$$

a red dye, occurring in commerce under the names of aniline red, azaleine, fuchsine, magenta, roseine, etc. It is prepared by heating a mixture of dry arsenic acid and aniline to 140°, for six or eight hours. It forms colorless crystalline plates, which are colored red on exposure to the air, insoluble in water, but soluble in alcohol. The aniline reds used in dyeing are generally monoacid salts of rosaniline more or less pure.

ROSARIO, the third city of the Argentine Republic, and the largest in Santa Fé; on the W. bank of the Paraná, 190 miles N. W. of Buenos Ayres. It has an excellent harbor, and carries on a large commerce direct with Europe; the exports exceed $100,000,000. The houses for the most part are of a single story; for the rest, the city is laid out, on a smaller scale, on the lines of Buenos Ayres, with narrow streets, few and paltry plazas, and only one monument of note—a lofty marble shaft (1883) bearing a figure of Victory and surrounded by four statues. Tramways run in every direction, and there is a telephone to Buenos Ayres. The city possesses an exchange, a theater, a great bull-ring, two markets, hospitals, steam elevators, a sugar factory, etc. Rosario was founded in 1725. Pop. about 250,000.

ROSARY, in ordinary language, a chaplet, a garland. Also, a bed of roses; a place where roses grow; or a coin so called from bearing the figure of a rose, of foreign coinage, about the size of a penny, but worth less than a halfpenny, chiefly smuggled into Ireland. In 1300 it was made death to import them. In comparative religion, a string of beads by means of which account is kept of the number of prayers uttered.

In the Roman Catholic Church: (1) A form of prayer in which the "Hail Mary" is recited 150 times in honor of the Virgin Mary. It is divided into 15 decades, each of which begins with the "Our Father" (see LORD'S PRAYER), is accompanied by meditation on one of the mysteries in the life of our Lord, and ends with the doxology. This is properly called the Dominican, or Great Rosary, but the name is often popularly given to the Chaplet, which contains but 50 aves. The 15 Mysteries which should be meditated on during the recitation of the Rosary are divided into three series, each corresponding to a chaplet:

1. Joyful.—The Annunciation, the Visitation, the Birth of Jesus, the Presentation in the Temple, the Finding in the Temple.
2. Sorrowful.—The Agony in the Garden, the Scourging at the Pillar, the Crowning with Thorns, the Carrying of the Cross, the Crucifixion.
3. Glorious.—The Resurrection, the Ascension, the Descent of the Holy Ghost, the Assumption, and the Coronation of the B. V. M.

There are also the Rosaries of St. Bridget, of the Seven Dolors, of the Immaculate Conception, of the Five Wounds, and the Crown of Our Saviour. (2) The beads on which any of the foregoing forms of prayers are said.

ROSARY SUNDAY, the first Sunday in October; a feast instituted by Gregory XIII. for the Confraternity of the Rosary, and made of universal observance after the victory of the Emperor Charles VI. over the Turks, in gratitude to the Blessed Virgin. An impetus has been given to the devotion of the rosary by Leo XIII., who enjoined its daily use in public during October. Roses are blessed and distributed as souvenirs, and the rosary is recited continually during the day.

ROSCIUS, QUINTUS, the most celebrated comic actor at Rome; born a slave about 134 B. C. He realized an enormous fortune by his acting, and was raised to the equestrian rank by Sulla. He enjoyed the friendship of Cicero, who in his early years received instruction from the great actor. Roscius died about 62 B. C.

ROSCOE, WILLIAM, an English historian; born in Mt. Pleasant, Liverpool,

England, March 8, 1753. His most important work, "The Life of Lorenzo de' Medici" (1796), did much toward stimulating English interest in Italian literature. His "The Butterfly's Ball and the Grasshopper's Feast" (1807), a nursery classic in verse, attracted the attention of the king and queen, and was set to music for the young princesses. Among his many other works may be named: "A General View of the African Slave Trade" (1788); "The Life and Pontificate of Leo the Tenth" (1805); and "On the Origin and Vicissitudes of Literature, Science and Art" (1817). He died in Toxteth Park, Liverpool, June 30, 1831.

ROSCOMMON, an inland county of Connaught, Ireland, called after Comon, a founder of monasteries and schools in the eighth century. The area is 949 square miles. The surface is fertile and is watered by the Shannon river. The plain of Boyle in the center, celebrated for sheep, is full of historical landmarks, and at Croaghon, formerly Rath Cruachain, the ancient burial-place of the kings of Connaught, still stands the pillar stone of King Dathi, killed in the Alps, 428 A. D. Sheep and cattle raising and agriculture are highly developed. The capital is Roscommon. Pop. about 90,000.

ROSE, the beautiful and fragrant flower which has given name to the large natural order *Rosaceæ*, seems to be confined to the cooler parts of the Northern Hemisphere. The species are numerous and are extremely difficult to distinguish. The rose is easily cultivated, and its varieties are almost endless.

Nature, almost unaided, will perform wonders in bringing forth new roses; but man, properly conversant with her secrets, can do much to help. Crossing, grafting, and bud variation are the methods practiced by growers. Of these crossing is the favorite and most successful; it consists in transferring the pollen of one variety to the stigma of another. The American Beauty rose had its birth in an almost neglected corner of the Washington garden of the late George Bancroft. Amid a tangle of roses of common varieties suddenly blossomed this new and wonderful rose. Slips were at once experimented with, and American Beauty has been steadily improved in size and fragrance.

ROSE, JOHN HOLLAND, an English historian, born at Bedford, England, in 1855. He was educated at Owens College, Manchester, and at Christ's College, Cambridge, graduating from the latter in 1879. He was lecturer on modern history to the Cambridge and London Societies for University Extension, in 1911, after which he was reader of modern history at Cambridge. His historical writings include "The Revolutionary and Napoleonic Era" (1894); "The Reign of Queen Victoria" (1897); "The Rise of Democracy" (1897); "William Pitt and the Great War" (1911); "Origins of the War" (1914); and "The Development of the European Nations, 1870-1914" (1915). He was one of the contributors to the Cambridge Modern History.

ROSE ACACIA (*Robinia hispida*, natural order *Leguminosæ*), a highly ornamental flowering shrub inhabiting the S. parts of the Alleghany Mountains, and now frequently seen in gardens in Europe. It is a species of locust; the flowers are large, rose-colored, and inodorous; the pods are glandular-hispid.

ROSE APPLE, or **MALABAR PLUM**, a tree of the genus *Eugenia*, the *E. Jambos*, belonging to the natural order *Myrtaceæ*. It is a branching tree, a native of the East Indies. The fruit is about the size of a hen's egg, is rose-scented, and has the flavor of an apricot.

ROSE, ATTAR OF. See ATTAR.

ROSEBAY, in botany, the popular name of the genus *Rhododendron*.

ROSEBERY, ARCHIBALD PHILIP PRIMROSE, FIFTH EARL OF, an English statesman; born May 7, 1847; was educated at Eton and Oxford, and succeeded his grandfather in 1868. He was an advanced Liberal in politics, and a ready and effective speaker. He was under-secretary at the home office, 1881-1883; lord privy seal and first commissioner of works, 1885; next year held the secretaryship of foreign affairs till the fall of Gladstone. Had he been able to enter the House of Commons, his rise would have been more rapid. In 1878 he was elected lord-rector of Aberdeen University; in 1880 of Edinburgh University; in 1899 of Glasgow University, Chancellor of the same in 1908. In 1889 he became a member of the London County Council, and was appointed chairman of that body. The University of Cambridge conferred the degree of LL.D. on him in 1888. He advocated the reform of the House of Lords, and was much interested in the questions of imperial federation and the social conditions of the masses. In 1878 he married Hannah, daughter of Baron Mayer de Rothschild; she died in 1890. When Mr. Gladstone succeeded to power Lord Rosebery became Secretary of Foreign Affairs, and in October of the same year (1892) he was made a Knight of the Garter. On the resignation of Mr. Gladstone in

March, 1894, the queen offered the post of prime minister to Lord Rosebery, and he carried on the government with no little success till July, 1895. He then urged on his supporters that the general election should be fought on the question of the predominance of the House of Lords. During 1896 his attitude on the Armenian question differed from that of Mr. Gladstone, and finally he decided on resigning the leadership of the party in order to leave himself an absolutely free hand on this question. He took no further active part in political life, but devoted his time chiefly to historical writing. Lord Rosebery kept an excellent racing stud and in 1894 and 1895 he won the Derby. Among his publications are: "Napoleon" (1900); "Lord Randolph Churchill" (1906); "Chatham" (1910).

ROSE CHAFER (*Cetonia aurata*), an injurious beetle, whose grubs destroy the roots of strawberries and other plants, while the adults spoil the flowers of roses, strawberries, and seed turnips. The eggs are laid in the ground; the full-grown grubs are whitish and about an inch and a half in length, after two or three years they pupate inside earthen cocoons. The adults, which are well able to fly from place to place, measure about an inch in length, are golden green above, coppery with a tint of rose beneath. The "rose-bug" of the Eastern United States is another beetle (*Macrodactylus subspinosus*), a voracious pest which destroys the flowers of rosaceous plants.

ROSECRANS, WILLIAM STARKE, an American military officer; born in Kingston, O., Sept. 6, 1819; was graduated at the United States Military Academy in 1842; entered the army as brevet 2d lieutenant of engineers, but after serving for a year at Hampton Roads returned to West Point as assistant Professor of Engineering. In 1847 he again entered active service, but resigned in 1854 to become a consulting engineer and architect in Cincinnati, O. He began his career in the Civil War by organizing and drilling the Home Guard in Ohio; and in June, 1861, was placed in charge of Camp Chase. He was made colonel of the 23d Ohio Volunteers soon afterward, and in a short time was appointed a Brigadier-General. He was second in command to General McClellan in the operations in West Virginia, engaging successfully in the actions at Rich Mountain, Va., and at Carnifax Ferry, Va., Sept. 10, 1861. In May, 1862, he commanded the right wing of the Army of the Mississippi during the siege of Corinth; and on June 11, 1862, succeeded General Halleck in the command of that army. On Oct. 26, 1862, he relieved General Buell of the command of the Army of the Cumberland, and on Oct. 30 began his memorable march to Nashville, Tenn. Owing to his defeat at Chickamauga in September of the following year he was superseded in command by General Thomas and assigned to the Department of Missouri. He was deprived of his command Dec. 9, 1864, whereupon he retired to Cincinnati, where he remained inactive till the close of the war. In 1868 he was appointed United States minister to Mexico; in 1880 and 1882 was elected to Congress; and in June, 1885, was appointed register of the United States Treasury. An act passed in 1889 restored him to the rank of Brigadier-General in the army and placed him on the retired list. He died near Redondo, Cal., March 11, 1898.

ROSEDALE, a city of Kansas, in Wyandotte co. It adjoins Kansas City, Kansas, on the N., and Kansas City, Missouri, on the E., and forms practically a part of Greater Kansas City. Pop. (1910) 5,960; (1920) 7,674.

ROSELLE, a borough of New Jersey, in Union co., on the Lehigh Valley, the Central of New Jersey, and the Rahway Valley railroads. Its principal industry is the manufacture of hydraulic machinery. Its notable buildings include a high school and a borough hall. Pop. (1910) 2,725; (1920) 5,737.

ROSELLE PARK, a borough of New Jersey in Union co., adjoining on the west the borough of Roselle. It is a separate borough and is entirely a residential place. Pop. (1910) 3,138; (1920) 5,438.

ROSEMARY, the *Rosmarinus officinalis,* a native of the S. of Europe and Asia Minor, and cultivated in India, etc.; a very fragrant labiate plant with a white or pale-blue corolla. The leaves are sessile and gray with edges rolled round below. It is sometimes made into garlands. It is slightly stimulant, and tends to relieve headache and mental weariness. It is an ingredient in Hungary-water. It is also used as a conserve, and a liquor is made from it.

ROSEN, ROMAN ROMANOVITCH, BARON, a Russian diplomat, born in 1849. He was educated at Reval, Dorpat, and Petrograd. He early entered the Department of Justice in the Russian Government, from which he was promoted to the Department of Foreign Affairs. From 1886 to 1894 he was Consul at New York and was chargé d'affaires at Washington, during the first administration of President Cleveland. He served as Secretary of Legation in Japan for one term and as Minister for two terms. In 1905

he was appointed Ambassador to the United States and was one of the Russian delegates during the peace negotiations at Portsmouth, N. H. He was appointed to the Council of the Empire following his services in the United States, and remained in this position at the outbreak of the Revolution, in 1917, when he escaped to the United States. He wrote in 1920 "Forty Years of a Diplomat's Life."

ROSENFELD, MAURICE (BERNARD), an American pianist and music critic, born in Vienna, Austria, in 1867. He came to the United States in 1873. He was educated at the College of the City of New York and the Chicago Musical College. From 1888 to 1911 he was a member of the faculty of this institution, from 1911 to 1912 of the Sherwood Musical School, and from 1912 a member of the board of musical directors of the Chicago Musical College. In April, 1916, he established, at Chicago, a piano school bearing his name. He was music editor of the Chicago "Examiner" (1907 to 1915) and of the Chicago "Daily News," beginning with 1917. He was also a contributor to the "Musical Courier," "Musical America," and several newspapers and was a member of several musical and journalistic societies. His appearances as a pianist were frequent and accompanied with success.

ROSENTHAL, MORITZ, a pianist; born in Lemberg, Austria-Hungary, Dec. 18, 1862. In 1876 he gave his first concert, which led to fame; in 1878 was pianist to the Rumanian Court; in 1878-1895 played in the principal cities of Europe; and in 1895 made his first appearance in London, where he was enthusiastically received. This was followed by many tours in Europe and the United States.

ROSENWALD, JULIUS, an American merchant and philanthropist. He was born at Springfield, Ill., in 1862, and in 1879 became connected with Hammerslough Brothers, wholesale clothiers, New York. In 1885 he became president of Rosenwald & Weil, Chicago, and later became vice-president and then president of Sears, Roebuck & Co., mail order business, Chicago. In 1916 he was appointed member of the Advisory Commission of the Council of National Defense and chairman of the commission on supplies. He has contributed time and money to civic, philanthropic, and educational enterprises and on his fiftieth birthday gave about $700,000 to the University of Chicago, Social Workers Country Club and other institutions. He gave handsomely to Y. M. C. A. buildings for colored men and to colored people in the South.

ROSE OF JERICHO (*Anastatica hierochuntica*), a plant of the natural order *Cruciferæ*, which grows in the sandy deserts of Arabia, and on rubbish, the roofs of houses, and other situations in Syria and other parts of the East. It is a small, bushy, herbaceous plant, seldom more than six inches high, with small white flowers; and after it has flowered the leaves fall off, and the branches become incurved toward the center, so that the plant assumes an almost globular form, and in this state it is often blown about by the wind in the desert. When it happens to be blown into water the branches expand again, and the pods open and let out the seeds. Numerous superstitions are connected with this plant, which is called Rosa Mariæ or Rose of the Virgin. If taken up before it is quite withered the plant retains for years its hygrometric property of contracting in drought and expanding in moisture.

ROSE POLYTECHNIC INSTITUTE, an engineering school founded at Terre Haute, Ind., in 1874, and opened for students in 1883. It has courses in mechanical, electrical, civil, architectural, and chemical engineering. There were in 1920 about 240 students. The productive funds amounted to nearly $1,000,000. Acting president, John White, Ph.D.

ROSES, WARS OF THE, a disastrous dynastic struggle which desolated England during the 15th century, from the first battle of St. Albans (1455) to that of Bosworth (1485). It was so-called because the two factions into which the country was divided upheld the two several claims to the throne of the Houses of York and Lancaster, whose badges were the white and the red rose respectively. The Lancastrian claim to the crown came through John of Gaunt, third son of Edward III., created Duke of Lancaster in 1362, having married three years before the heiress of Henry, Duke of Lancaster. On John of Gaunt's death King Richard II. seized his lands, whereupon his son Bolingbroke, then in exile, returned to assert his rights, and, finding his cause exceedingly popular, was emboldened to claim the crown, which was granted him by the Parliament after the deposition of his cousin Richard II. After the House of Lancaster had thus possessed the throne for three reigns (Henry IV., V., VI.), Richard, Duke of York, during the weakness of the last reign, began to advance, at first somewhat covertly, his claim to the throne. He was the son of Richard, Earl of Cambridge,

by Anne, sister of Edmund Mortimer, the last Earl of March, and he was thus the nearest actual heir to Edward III. through his second son, Lionel, Duke of Clarence.

The reigning family had become unpopular from its loss of France and its clericalism, but its strength was great in the N., where the power of the Percies was alone rivaled by that of the Nevilles. The Yorkist strength lay chiefly in the mercantile population of the southern counties. The effect of the war was the almost complete destruction of the old nobility, the weakening of the power of the Church, and an enormous increase in the power of the crown, together with the great advance of the commercial classes and the large towns, destined a few generations later to measure strength with the crown itself. In 1454 Richard was appointed protector of the realm during Henry's insanity, and on his recovery soon after took up arms against his rival Somerset and crushed him at the first battle of St. Albans (1455). A second period of insanity again gave him the protectorship, but the king recovered in 1456. His weak attempts at reconciliation proved failures, and in 1460 the Yorkist earls of Salisbury, Warwick, and March defeated and captured the King at Northampton (1460).

The lords now decided to grant the reversion of the crown to York, passing over Prince Edward. The queen refused assent and fled to Scotland, returning only after the death of York at Wakefield (Dec. 30, 1460); but York's son Edward quickly gained a victory at Mortimer's Cross (1461) though Warwick was defeated by the queen's main body in the second battle of St. Alban's (1461). But London rallied to young Edward, and in June he was crowned at Westminster after the great victory of Towton (1461). Next year Queen Margaret again appeared in the N. but in 1464 her forces were utterly routed by Warwick's brother, Montague, at Hedgeley Moor and Hexham. The estrangement of Warwick and his alliance with Queen Margaret's party drove Edward IV. from England and restored Henry VI. But Edward returned in the spring of 1471, defeated (and slew) Warwick at Barnet, and the queen at Tewkesbury. The murder of Prince Edward after the battle, and the convenient death of Henry VI. in the Tower, cleared away his two chief dangers and left him to reign in peace. The accession of Henry VII. after the death of Richard III. on Bosworth field (1485), his marriage with Elizabeth, daughter of Edward IV. (1486), and the blending of the red and white rose in the Tudor badge, marked the termination of the Wars of the Roses, though the reign of Henry, whose own title was not good, was from time to time disturbed by the pretentions of Yorkist impostors.

ROSETTA, a town of the Nile delta in Egypt, on the old Bolbitic arm of the river, 9 miles from its entrance into the Mediterranean and 44 miles N. E. of Alexandria. In the time of the Crusades it was a place of great strength; and St. Louis made it the basis of his crusading operations. Sultan Beybers, after that (in 1251) founded the present city farther inland. The Arabs call it Raschid, believing that Haroun al-Raschid founded the old city. A few miles to the N. of the town was discovered the ROSETTA STONE (*q. v.*). At Rosetta, too, are barrage works for holding up the Nile water till it can be directed into the irrigation channels. These works, originally constructed by Mougel Bey (1843-1861), were almost entirely rebuilt by Sir C. Scott Moncrieff in 1886-1890. The barrage is 508 yards long and has 61 arches. Pop. about 16,000.

ROSETTA STONE, the name given to a stone found near the Rosetta mouth of the Nile by a French engineer in 1798. It is a tablet of basalt, with an inscription of the year 196 B. C., during the reign of Ptolemy Epiphanes. The inscription is in hieroglyphic, in demotic, and in Greek. It was deciphered by Dr. Young, and formed the key to the reading of the hieroglyphic characters. It was captured by the English on the defeat of the French forces in Egypt, and is now kept in the British Museum.

ROSETTA WOOD, a good-sized East Indian wood, imported in logs, 9 to 14 inches in diameter; it is handsomely veined, and its general color is a lively red-orange. The wood is close, hard, and very beautiful when first cut, but soon becomes darker by exposure to the air.

ROSETTI, or ROSETI, CONSTANTIN, a Rumanian poet and politician; born in Bucharest, Rumania, June 14, 1816. He published a volume of poems under the title of "Hours of Contentment" (1843); and wrote many political treatises, poems, and translations, a new edition of which appeared in Bucharest in 1885. He died April 19, 1885.

ROSEWATER, VICTOR, an American journalist, born in Omaha, Nebraska, in 1871. He was educated at Columbia University. In 1893 he began his journalistic career on the Omaha "Bee," becoming managing editor in 1895, editor in 1906, and publisher in 1917. He took an active interest in Republican affairs, being a member of the Republican Na-

tional Committee, 1908 to 1912. He was also at various times a member of the National Civic Federation, the American Jewish Committee, and of several historical and economic associations. During the World War he served as a member of the Committee on Labor, Advisory Commission of the Council of National Defense, as well as the Nebraska State Administrator of paper and pulp of the War Industries Board. He has frequently contributed to magazines and wrote "Special Assessments—a Study in Municipal Finance" (1898).

ROSE WINDOW, a circular window, divided into compartments by mullions and tracery radiating from a center, also called Catharine wheel and marigold window according to modifications of the design. It forms a fine feature in the church architecture of the 13th and 14th centuries, and is mostly employed in the triangular spaces of gables. Some examples, as that of Rheims Cathedral, are over 40 feet in diameter.

ROSEWOOD, a valuable wood, the best of which comes from Brazil. Two kinds, or two qualities, are known in commerce. These much resemble each other, the one, which is usually rather the better figured of the two, coming from Rio de Janeiro, the other from Bahia. Three well-known Indian species of this genus are called respectively, *Dallergia latifolia, D. sissoo,* and *D. cultrata,* all of which, except that they want the dark blotchy veining, closely resemble the Brazilian rosewoods. They are all rich in resinous coloring matter, and all except *D. latifolia,* which is slightly lighter, have a specific gravity ranging between .900 and 1.000, so that they just float in water. Since at least 1830 the *D. latifolia* has been known in England as Indian rosewood. The South American and Indian kinds named above are all hard and durable and take a fine polish. The Indian rosewood is often elaborately carved by native workmen, and for this purpose it is well suited. An inferior kind of rosewood is brought from Honduras. The name is said to have been given because of a striking rose-like odor that the wood gives out when freshly cut.

ROSICRUCIANS, a mystic secret society which became known to the public early in the 17th century, and was alleged to have been founded by a German noble called Christian Rosenkreuz, A. D. 1378. He was said to have died at the age of 102. The society consisted of adepts, who perpetuated it by initiating other adepts. It did not interfere with religion or politics, but sought after true philosophy. The Rosicrucians pretended to be able to transmute metals, to prolong life, and to know what was passing in distant places. They are said to have died out in the 18th century.

ROSIN. See RESIN.

ROSLIN, a Midlothian village, near the wooded glen of the North Esk, 6½ miles S. of Edinburgh, Scotland. Its castle, dating from the 14th century, was the seat of the St. Clairs, Earls of Orkney from 1379 to 1471, and afterward of Caithness, and hereditary grand-master of Masons of Scotland from 1455 to 1736. The exquisite "chapel" built about 1450, is really the choir of an intended collegiate church, and is only 70 feet long, 35 broad, and 42 high. Its beauty lies not in the outline, but in the profusion of stone-carving lavished on pinnacles, niches, vaulted roof, and clustered columns, and especially on the famous "Prentice pillar." Much damaged by an Edinburgh mob in 1688, it was restored by the 3d Earl of Rosslyn and has served since 1862 as an Episcopal church. On Roslin Moor the Scotch are said to have twice defeated the English in one day, Feb. 24, 1303.

ROSMINI, ANTONIO ROSMINI-SERBATI, an Italian philosopher; born of noble family at Roveredo in the Italian Tyrol, March 25, 1797. After a stainless youth of devotion and study, he decided for the priesthood against his parents' wishes, and began the course at Padua in 1817. Three years later his father's death gave him an ample estate. He was ordained priest in 1821, and devoted the next five years at home to study, meditation and prayer. He formed a comprehensive and coherent system to serve as a basis for the truths of revelation, and planned a new institution for the training of teachers and priests in wisdom and holiness. From 1826 to 1828 he lived mostly in Milan, next thought out the rule of his new order in a period of retirement and severe mortification at Domodossola in the Piedmontese Alps, visited Rome, gained the approval of Pius VIII. both for his special studies and for the institution of his order, and published his "New Essay on the Origin of Ideas" (4 vols. 1830), which at once carried his name over the Catholic world. He identified himself with rational movements and lost power with the Pope. His works filled 35 volumes and they were placed on the Index in 1849. Rosmini retired to Stresa, where he died in 1855.

ROSOLIC ACID, in chemistry,

$$C_{20}H_{16}O_3 = \begin{matrix} H_4C_6 \\ | \\ O \end{matrix} > C < \begin{matrix} C_6H_3\ (CH_3)\ O\ H. \\ C_6H_4\ (OH), \end{matrix}$$

a weak acid prepared by treating rosani-

line with nitrous acid, and boiling the resulting diazo-compound with hydrochloric acid. It forms shining monoclinic prisms, closely resembling those of aurine, melts above 220°, is insoluble in water, but dissolves readily with brownish-yellow color in alcohol and ether. Boiled with aniline and benzoic acid it yields a beautiful and permanent blue dye.

ROSS, BETSY, famous in history as the maker of the first American flag. She was born in 1752, in Philadelphia, a daughter of Samuel Griscom, who helped to erect Independence Hall, and was married to John Ross. Following the decision of the Continental Congress in respect to a national flag, a committee, including George Washington, Robert Morris, and George Ross called on Mrs. Ross and invited her to undertake the sewing. She agreed and it was on her suggestion that the five-point rather than the six-point star was used. Mrs. Ross contracted to make all the government flags and the business continued in the family till 1857. Mrs. Ross died in 1836. In 1898 the Betsy Ross Memorial Association was formed, and in 1905 the house of Betsy Ross was converted into public property as the American Flag House.

ROSS, EDWARD ALSWORTH, an American economist, born at Virden, Ill., in 1866. He graduated from Coe College in 1886 and took post-graduate studies at the University of Berlin and at Johns Hopkins. In 1891-2 he was professor of economics at Indiana University, and in 1892-3 was associate professor of political economy and finance at Cornell. He became professor of sociology in Leland Stanford Jr. University in 1893; he occupied the same chair at the University of Nebraska (1901-6). In 1906 he was professor of sociology at the University of Wisconsin. He lectured on sociology at Harvard, Chicago, and other universities. His works on economic subjects include "Honest Dollars" (1896); "Social Control" (1901); "Sin and Society" (1907); "The Changing Chinese" (1911); "Changing America" (1912); "The Old World in the New" (1914); "Russia in Upheaval" (1918); and "What Is America?" (1919).

ROSS, SIR JAMES CLARK, an English Arctic and Antarctic explorer; born in London, England, April 15, 1800. He entered the British navy at the age of 12, accompanied his uncle, Sir John Ross, on his two voyages in search of a N. W. passage, and in the interval between them accompanied Capt. William Parry in his three Arctic voyages. He was promoted to the rank of post-captain in 1834, particularly for the discovery of the North magnetic pole in 1831. He commanded the expedition in the "Erebus" and "Terror" to the Antarctic Ocean in 1839–1843; and on his return published a narrative of that voyage, which had contributed largely to geographical and scientific knowledge generally. Captain Ross was knighted for his services, and received numerous other honors. In 1848 he made a voyage in the "Enterprise" to Baffin Bay in search of Sir John Franklin. He died in Aylesbury, England, April 3, 1862.

ROSS, SIR JOHN, an English Arctic navigator; born in Inch, Wigtownshire, Scotland, June 24, 1777. In 1786 he entered the navy, and saw a considerable amount of service before the peace of 1815, which found him with the rank of commander. In 1817 he accepted the command of an admiralty expedition to search for a N. W. passage, and in April, 1818, set sail in the "Isabella," accompanied by Lieutenant Parry in the "Alexander." After passing through Davis Straits and Baffin Bay the vessels entered Lancaster Sound and proceeded up it for a considerable distance, when Ross conceived the erroneous idea that the sound was here brought to a termination by a chain of mountains, and accordingly returned to England. Shortly after landing he was advanced to the rank of post-captain, and the following year published an account of his voyage. His next expedition, in the steamer "Victory," was equipped by Sir Felix Booth and set out in May, 1829. Ross entered Prince Regent Inlet and discovered and named Boothia Felix and King William Land. In 1832 he was forced to abandon his ships, and he and his crew suffered great hardships before they were picked up in August, 1833, by his old ship, the "Isabella." In 1834 Captain Ross was knighted, and in the following year published a narrative of his second voyage. From 1839 till 1845 he was consul at Stockholm. In 1850 he made a last Arctic voyage in the "Felix," in a vain endeavor to ascertain the fate of Sir John Franklin. He became a rear-admiral in 1851, and died in London, England, Aug. 30, 1856.

ROSS, ROBERT BALDWIN, a British art critic, born at Tours, France, in 1869. He was the son of John Ross, attorney-general for Upper Canada, and received part of his education at Cambridge University, England. He took up newspaper writing and soon became known as an authority on art, the drama and literature. In 1908–12 he worked on the staff of the "Morning Post" and acted as adviser to the Inland Revenue on picture valuations, 1912–14. He wrote and edited some books,

among them Wilde's works and a biography of Aubrey Beardsley. He died in London in 1918.

ROSSE, WILLIAM PARSONS, THIRD EARL OF, an English astronomer; born in York, England, June 17, 1800. Though a representative Irish peer, Lord Rosse's chief attention was devoted to the study of practical astronomy. In 1827 he constructed a telescope, the speculum of which had a diameter of three feet, and the success and scientific value of this instrument induced him to attempt to cast a speculum twice as large. After many failures, Lord Rosse succeeded in 1845 in perfecting machinery which turned out the huge speculum, weighing three tons, without warp or flaw. It was then mounted in his park at Parsonstown, at a cost of $150,000 on a telescope 54 feet in length with a tube 7 feet in diameter. A series of cranks, swivels, and pulleys enables this huge instrument to be handled almost with as much ease as telescopes of ordinary size. The sphere of observation was immensely widened by Lord Rosse's instrument, which has been chiefly used in observations of nebulæ. He died Oct. 31, 1867.

ROSSER, THOMAS LAFAYETTE, an American soldier, born in Campbell co., Virginia, in 1836. He entered West Point in 1856, but resigned on the outbreak of the Civil War to enter the artillery service of the Confederate army. He was afterward transferred to Stuart's cavalry, where he became brigadier-general. He became a major-general in 1864. He refused to surrender at the close of the war, but made his escape and attempted to reorganize the Confederate forces in northern Virginia. He was captured, but was soon released. In 1871 he was appointed chief engineer of the Eastern Division of the Northern Pacific. From 1881 to 1886 he acted as chief engineer of the Canadian Pacific railroad. During the Spanish-American War he served as brigadier-general of the United States volunteers. He died in 1910.

ROSSETTI, the name of an Italian family, the most famous members of which were:

ROSSETTI, GABRIELE, an Italian poet and critic; born in Vasto, Abruzzo Citeriore, then forming part of the kingdom of Naples, Feb. 28, 1783. His father, Nicola Rossetti, was engaged in the iron trade of the district; his mother was Maria Francesca Pietrocola. The parents were not in easy circumstances, and had a large family; besides Gabriele, two of the sons attained some eminence, Andrea becoming a canon in the Church, and Domenico being well reputed in letters and antiquities. Gabriele gave early signs of more than common ability, and was placed by the local grandee, the Marchese del Vasto, to study in the University of Naples. He had a fine tenor voice, and was sometimes urged to try his success on the operatic stage; he drew with such precision that some of his extant pen-drawings with sepia-ink might readily be taken for steel engravings; he composed poetry, both written and improvised, and became one of the most noted improvisatori in Naples. The boyhood and youth of Rossetti passed in a period of great political commotion, consequent on the revolutionary and imperial wars of France. The Bourbon King of Naples, Ferdinand I., was ousted by the Parthenopean Republic, and again by King Joseph, the brother of Napoleon, and his successor King Joachim (Murat), the emperor's brother-in-law, and Ferdinand had to retire to Sicily.

Rossetti obtained an appointment as curator of ancient bronzes in the Museum of Naples, and also as librettist to the operatic theater of San Carlo; he wrote the libretto of an opera, "Giulio Sabino," was well received at the court of the Napoleonic sovereigns, and in 1813 acted as a member of the provisional government sent to Rome by Murat. After the restoration of Ferdinand to Naples in 1815 he continued his connection with liberal politicians and joined the widely diffused secret society of Carbonari. In 1820 a military uprising compelled King Ferdinand to grant a constitution on the model of that which had recently been established in Spain. Rossetti saluted its advent in one of his most celebrated odes, beginning, "Beautiful indeed art thou, with the stars in thine hair." The good faith of the king was highly dubious from the first, and in 1821 he abrogated the constitution and put it down with the aid of Austrian troops. The Constitutionalists were proscribed and persecuted, Rossetti among them. He escaped and about 1824 made his way to London to follow the career of a teacher of Italian. In 1826 he married Frances Mary Lavinia Polidori, daughter of a Tuscan father and English mother; soon afterward he was elected Professor of Italian in King's College, London. They had four children: (1) Maria Francesca, born 1827, died 1876 (author of "A Shadow of Dante," etc.); (2) Gabriel Charles Dante (see below); (3) William Michael, born 1829 (critical writer, and editor of Shelley; see below); (4) Christina Georgina (see below). In London Rossetti lived a studious, laborious, and honorable life. In politics he was a vigorous liberal, but more inclined to a constitutional monarchy than a republic; in religion he was

mainly a freethinker, but tending in his later years toward an undogmatic form of Christianity. Though totally opposed to the papal system and pretensions, he would not openly abjure, in a Protestant country, the Roman Catholic creed of his fathers. His health began to fail in 1842, and his sight became dim. After some attacks of a paralytic character he died in London, April 26, 1854.

Besides some poems published in Italy, Rossetti produced the following works: "Dante, Commedia" (the Inferno only was published), with a commentary aiming to show that the poem is chiefly political and anti-papal in its inner meaning (1826); "Lo Spirito Antipapale che produsse la Riforma" ("The Anti-Papal spirit which produced the Reformation"—an English translation also was published), reinforcing and greatly extending the same general views (1832); "Iddio e l'Uomo, Salterio" ("God and Man, a Psaltery"), poems (1833); "Il Mistero dell' Amor Platonico del Medio Evo" ("The Mysterious Platonic Love of the Middle Ages"), five volumes (1840). This book was printed and prepared for publication, but withheld as likely to be deemed rash and subversive; "La Beatrice di Dante," contending that Dante's Beatrice was a symbolic personage, not a real woman (1842); "Il Veggente in Solitudine" ("The Seer in Solitude"), a speculative and partly autobiographical poem (1846); it circulated largely, though clandestinely, in Italy, and a medal of Rossetti was struck there in commemoration; "Versi" (miscellaneous poems) (1847); and "L'Arpa Evangelica" ("The Evangelic Harp"), religious poems (1852).

CHRISTINA GEORGINA, an English poet; born in London, England, Dec. 5, 1830, daughter of the preceding. "Goblin Market" (1862) is regarded as her finest production. Her other writings consist chiefly of lyric poems of great beauty, and sonnets mostly of a devotional order. They include: "The Prince's Progress" (1866); "Commonplace, and Other Short Stories" (in prose: 1870); "Sing-Song: A Nursery Rhyme Book" (1872); "Annus Domini: A Prayer for Each Day in the Year" (1873); "Speaking Likenesses" (1874); "Seek and Find" (1879); "A Pageant, and Other Poems" (1881); "Letter and Spirit" (1883); "Verses" (1893); and several posthumous works. She died Dec. 29, 1894.

DANTE GABRIEL (or properly GABRIEL CHARLES DANTE), an English painter and poet; born in London, May 12, 1828, eldest son of Gabriele. He was educated in King's College School, London; but, having from his earliest years evinced a wish to become a painter, he was taken from school in 1843 and began the study of art, entering soon afterward the antique school of the Royal Academy. Here he associated with the young painters John Everett Millais and William Holman Hunt, and the sculptor Thomas Woolner; along with these three he founded the so-called Pre-Raphaelite Brotherhood, which was completed by the addition of three other members. The chief incentive to the foundation of this society, and of the school of art which it initiated, was the distaste of the followers for the commonplace subjects and slurred execution in current English art. They aimed to revive the lofty feeling, and patient handiwork, which had been developed by the European schools of art preceding the culmination of Raphael and his followers.

The English Pre-Raphaelites wished to exhibit true and high ideas through the medium of true and rightly elaborated details. Rossetti's earliest oil picture, exhibited in 1849, was "The Girlhood of Mary Virgin"; his next (1850), now in the National Gallery, "The Annunciation." After this he withdrew from exhibiting almost entirely, and his art developed through other phases, in which the sense of human beauty, intensity of abstract expression, and richness of color were leading elements. He produced numerous water-colors of a legendary or romantic cast, several of them being from the poems of Dante, others from the Arthurian tradition.

Among his principal oil pictures are the Triptych for Llandaff Cathedral, of the "Infant Christ Adored by a Shepherd and a King," "The Beloved" (the Bride of the Canticles), "Dante's Dream" (now in the Walker Gallery, Liverpool), "Beata Beatrix" (National Gallery), "Pandora," "Proserpine," "The Blessed Damozel" (from one of his own poems), "The Roman Widow," "La Ghirlandata," "Venus Astarte," "The Day-dream." He designed several large compositions, such as the "Magdalene at the door of Simon the Pharisee," "Giotto Painting Dante's Portrait," "Cassandra," and the "Boat of Love" (from a sonnet by Dante). Notwithstanding his passionate impulse as an inventive artist, and his impressive realization of beauty in countenance and color, some shortcomings in severe draughtsmanship and in technical method, and some degree of mannerism in form and treatment, have often, and not unjustly, been laid to his charge.

Rossetti began writing poetry about the same time that he took definitely to the study of painting. Besides some juvenile work, and some translations from the German (that of "Henry the Leper," by the mediæval poet, Hartmann

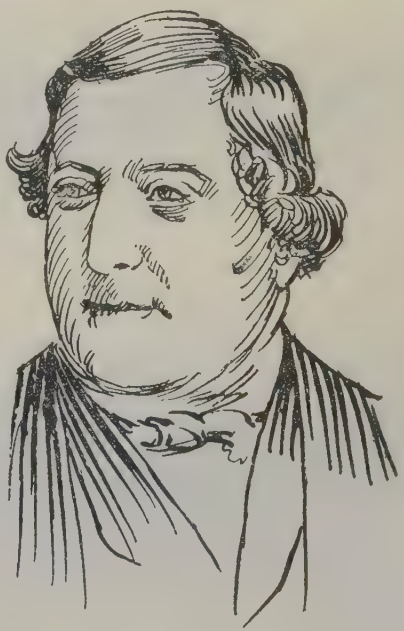
von der Aue, is preserved), he executed a number of translations from Dante and other Italians, published in 1861 as "The Early Italian Poets," and again in 1874 as "Dante and his Circle." Two of his best-known original poems, "The Portrait" and "The Blessed Damozel," were written in his 19th year, and many others followed. Rossetti had fallen in love toward 1851 with a very beautiful girl, a dressmaker's assistant, named Elizabeth Eleanor Siddal; he married her in 1860, but she died suddenly in February, 1862. In the first impulse of desperation he buried his MSS. in her coffin. In 1869 he thought fit to recover them, and in 1870 he issued his volume named "Poems." This volume was a success with poetical readers, and was reviewed with great admiration and even enthusiasm by some leading critics. Late in 1871, however, Mr. Robert Buchanan, writing in the "Contemporary Review" under the pseudonym of "Thomas Maitland," attacked the book on literary, and more especially on moral grounds.

Rossetti was now in a depressed state of health, suffering much from insomnia, from an abuse of chloral as a palliative, and from weakened eyesight. About the middle of 1872 he became morbidly sensitive and gloomy, and very recluse in his habits of life. In 1881 he published a second volume of poems named "Ballads and Sonnets" (containing some of his finest work, "Rose Mary," "The White Ship," "The King's Tragedy," and the completed sonnet-sequence, "The House of Life"). A touch of paralysis affected him toward the end of 1881, and, retiring in the hope of some improvement to Birchington-on-Sea, near Margate, he died there April 9, 1882.

The poetry of Rossetti is intense in feeling, exalted in tone, highly individual in personal gift, picturesque and sometimes pictorial in treatment, and elaborately wrought in literary form. These characteristics are sometimes made consistent with simplicity, but more generally with subtlety, of emotion or of thought. As in his paintings, there is a strong mediæval tendency.

WILLIAM MICHAEL, an English poet and art critic; born in London, England, Sept. 25, 1829; brother of Dante Gabriel. He entered the excise office in 1845, and was assistant secretary of the Board of Inland Revenue in 1869–1894. He was the author of "Dante's Comedy—The Hell, Translated into Literal Blank Verse" (1865); "Poems and Ballads: A Criticism" [of Swinburne] (1866); "A Life of Percy Bysshe Shelley" (1869); and "Life of John Keats" (1887). He edited the works of many poets. He died in 1919.

ROSSINI, GIOACCHINO ANTONIO, one of the most popular, and perhaps the greatest Italian composer of operas; born in Pesaro, Italy, Feb. 29, 1792. His parents belonged to a strolling opera company, and he began his career by playing second horn to his father when he was only 10 years old. Having a fine voice, his father had him taught singing by an eminent professor, and he took the treble parts as a chorister in the Bologna churches, and soon became an excellent singer and accompanist. The breaking of his voice put an end to his



GIOACCHINO ANTONIO ROSSINI

occupation as a chorister, and at the age of 15 he was admitted into the Lyceum at Bologna, and received lessons in counterpoint from Padre Mattei. But his ardent nature turned restive under the strict discipline and dry studies of Mattei, and, conscious of the possession of genius, he set to work assiduously to educate himself—studying intently the best models, Italian and German. He produced some light operatic pieces, the only one of which juvenile efforts that has lived is the "Lucky Trick," which came out in 1812. "Tancred," brought out at Venice in 1813, when he was scarcely more than 20 years of age, all at once made his name famous. In 1816 he produced his world-famous "Barber of Seville" at Rome. Those of his other works which still keep the stage are:

"Othello," "Moses in Egypt," "Semiramide," "The Pilfering Magpie," "The Lady of the Lake," "Count Ory," and "William Tell." This last, the greatest and most original of his works, was written at the age of 37, and with it closed the career of Rossini as a composer. After holding the post of manager of the Italian Theater at Paris during some time, he, in 1836, returned to his native country, where he continued to reside till 1856, when he repaired to Paris once more. His only important work since the production of "William Tell" is his well-known "Stabat Mater." He died in his villa in Passy, near Paris, Nov. 13, 1868.

ROSTAND, EDMOND, a French poet; born in Marseilles, France, in 1868; was educated in Paris; and in 1894 his first play "The Romanesques" was produced at the Comédie Française. It was an instantaneous success and was followed by "Princess Lointaine" (1896); "La Samaritaine" (1897); "Cyrano de Bergerac" (1897); "L'Aiglon" ("The Eaglet," 1900), and "Chantecler" (1910). The last three were translated into English and played in the United States by Richard Mansfield and Maude Adams. Rostand's versification is of remarkable beauty. On May 30, 1901, he was elected one of the 40 "immortals" of the French Academy. He died in 1918.

ROSTER, in military language, a term implying the seniority list from which officers are detailed for duty in regular succession; hence, occasionally, a list showing the turn or rotation of service or duty, as in the case of military officers and others who relieve or succeed each other.

ROSTOPCHIN, FEODOR VASSILIEVICH, COUNT, a Russian general; born in the province of Orel, Russia, March 23, 1763. Entering the Russian military service as a lieutenant in the Imperial Guard, he won great influence over the weak mind of the Emperor Paul, who promoted him to various offices in rapid succession. In May, 1812, the Emperor Alexander appointed him governor of Moscow. He it was, according to the French writers, who planned and began with his own hand the burning of Moscow. But in 1823 he published "The Truth About the Burning of Moscow" (Paris, 1823), in which he rebuts the charge. Nevertheless, he subsequently recalled this denial and admitted that he at least set fire to his own mansion house. His works, which include a number of historical memoirs, two comedies, etc., in Russian and French, were published at St. Petersburg in 1853. He died in Moscow, Jan. 30, 1826.

ROSTOV-ON-DON, a city of Russia, situated in the delta of the Don river, near the Sea of Azov. Before the World War it was an important trade center, from which was shipped vast quantities of grain and flour. The manufactures alone amounted to ten million dollars a year. Here are located the largest flour mills in the world. The city is also the center of the Donetz Basin coal mines, for which the Bolsheviki and the counter-revolutionary forces under Denikin struggled fiercely during 1919. The Bolsheviki have held the city since the beginning of 1920. The population of about 175,000 consists largely of Cossacks.

ROSTRUM, plural **ROSTRA,** a scaffold or elevated platform in the Forum at Rome, from which public orations, pleadings, funeral harangues, etc., were delivered; so called from the rostra or beaks of ships with which it was ornamented. Also a pulpit, platform, or elevated place from which a speaker, as a preacher, an auctioneer, etc., addresses his audience.

ROSWELL, a city of New Mexico, the county-seat of Chaves co. It is on the Pecos river and on the Atchison, Topeka and Santa Fé railway. It is the center of an important agricultural and cattle and sheep raising industry. Its notable institutions include the New Mexico Military Institute, St. Mary's Hospital, a public library, and a Federal building and courthouse. Pop. (1910) 6,172; (1920) 7,033.

ROT, a disease in sheep and other graminivorous animals, produced by the hydratids *Fasciola hepatica* and *Distoma lanceolatum,* often living in great numbers in the gall-ducts and bladder of the animal. The latter parasite has been detected in the human subject.

ROTATION, in astronomy, the turning round of a planet on its imaginary axis, like that of a wheel on its axle. In the infancy of astronomy it was assumed that the earth was at rest, and that the sun and stars moved round it from E. to W. After note had been taken of the fact that when a boat is gently gliding along a canal or tranquil lake, the sensation to one on board is as if the boat was stationary, and the objects on the bank moved past in the opposite direction, a second hypothesis became worth consideration, viz., that the apparently stationary earth might be like the moving boat, and the heavens resemble the really stationary bank. It

gathered strength when it was considered that the earth was not a sphere but an oblate spheroid, as if rapid whirling had bulged it out at the equator, that Jupiter was yet more flattened at the poles than the earth, and that the direction of the trade winds, cyclones, etc., seemed the result of rotation. In 1851 Foucault completed the proof by making visible to the eye that a pendulum with a very long string alters its direction in a way which cannot be accounted for except by rotation (see GYROSCOPE). The rotation of the earth is performed with a uniform motion from W. to E. and occupies the interval in time which would elapse between the departure of a star from a certain point in the sky and its return to the same point again. The only motions which interfere with its regularity are those of the precession of the equinoxes and nutation (see PRECESSION). The time taken for the rotation of the earth measures the length of its day. So with the other planets. The sun also rotates as is shown by the movement of spots across its disk (see SUN). The earth's rotation slightly increases the force of gravity in moving from the equator to the poles. Sir William Thomson reasoning from some small anomalies in the moon's motion, inferred that 10,000,000 years ago the earth rotated one-seventh faster than it does now, and that the centrifugal force then was to that now as 64 to 49.

In botany, a rotary movement of a layer of protoplasm, investing the whole internal surface of a cell, as well seen in Chara, etc. It was first investigated by Corti in 1774. Called more fully intercellular rotation. In physiology: (1) The movement of a bone round its axis, without any great change of situation. (2) The moving of the yolk in an ovum at a certain stage of development on its axis in the surrounding fluid. This was first observed by Leuwenhoeck in 1695.

ROTATION OF CROPS, the cultivation of a different kind of crop each year, for a certain period, to prevent the exhaustion of the soil. If a plant requiring specially alkaline nutriment be planted year after year in the same field or bed, it will ultimately exhaust all the alkalies in the soil and then languish. But if a plant be substituted in large measure requiring siliceous elements for its growth, it can flourish where its alkaline predecessor is starved. Meanwhile the action of the atmosphere is continually reducing to a soluble condition small quantities of soil, thus restoring the lost alkalies. Manure will replace lost elements more quickly. The period of rotation is often made four years.

ROTHENSTEIN, WILLIAM, a British artist. He was born in Bradford, Yorkshire, England, in 1872, and was educated at Bradford Grammar School. He went to London in 1888 and worked under Legros at the Slade School and afterward in Paris, where he first exhibited. In 1893 he went to Oxford and drew portraits and settled in Chelsea shortly afterward. He has pictures and portraits in the Tate Gallery; British Museum; Victoria and Albert Museum; St. John's College, Cambridge; Trinity Hall, Cambridge; Carnegie Institute, Pittsburgh; Magdalen College, Oxford; National Portrait Gallery, Edinburgh; Luxembourg, Paris, etc. His publications include: "Oxford Characters," "English Portraits," "Manchester Portraits," "Liber Juniorum"; six portraits of Rabindranath Tagore.

ROTHERHAM, a manufacturing town in the West Riding of Yorkshire, England, on the Don, here joined by the Rother; 5 miles E. N. E. of Sheffield. Its chief glory is the magnificent cruciform church, Perpendicular in style, with crocketed spire and fine W. front. It is probably somewhat earlier than its reputed founder, Thomas de Rotherham, Archbishop of York (1423–1500); in 1875 it was restored by Sir G. G. Scott. A handsome edifice in the Collegiate Gothic style, built for an independent college in 1875, has been bought and applied to the purpose of a grammar school (1843), at which Bishop Sanderson was educated. There are also a mechanics' institute (1853); a free library (1881); an infirmary (1870); a covered market (1879); public baths (1887); a park (1876) of 20 acres, 300 feet above the town; and the Clifton Park of 57 acres. The manufactures include stoves, grates, chemicals, pottery, glass, railway carriages, etc. Ebenezer Elliott was a native of the suburb of Masborough, which is included within the municipal boundary, incorporated in 1871. Roche Abbey, a ruin, 8 miles E. S. E., was a Cistercian foundation (1147); and 8 miles N. E. is Conisborough Castle. Pop. (1919) 71,913.

ROTHERMERE, HAROLD SIDNEY HARMSWORTH, FIRST VISCOUNT, a British newspaper proprietor. He was born in 1868 at Dublin, Ireland, son of Alfred Harmsworth, and removing to England, following the example of his brother, Lord Northcliffe, became interested in newspapers, of which he is the proprietor of several. He endowed the King Edward VII. Chair of English Lit-

erature and the Vere Harmsworth Chair of Naval History at Cambridge University. The success of the Union Jack Club is largely due to his assistance and support. In 1916-17 during the World War he was director-general of the Royal Army Clothing Department. In 1917–18 he was Air Minister, being created viscount in 1919.

ROTHSCHILD (red shield), the name of a Jewish family of European bankers and capitalists, the enormousness of whose aggregate wealth has passed into a proverb. The founder of this race of financiers, MEYER ANSELM ROTHSCHILD, born at Frankfort-on-the-Main in 1743, died there in 1812, after having accumulated the most gigantic fortune ever possessed by a single individual up to his day. Commencing as a small trader, he, by his probity, frugality, and superior business qualifications, eventually became the banker of monarchs and the creditor of states. Of the five sons who succeeded to the vast inheritance he bequeathed them, the eldest, ANSELM (born 1773, died 1855), was his father's partner and successor at Frankfort. The second, SOLOMON (born 1774, died 1855), became established as the representative of the house of Rothschild at Vienna. The third, NATHAN MEYER (born 1777, died 1836), settled as the London partner, and became the leading member and ablest financier of the family. The fourth, CHARLES (born 1788, died 1855), filled the representation of the firm at Naples. Lastly, JAMES (born 1792, died 1868), eventually took up his residence in Paris, where he died, leaving a fortune estimated at $200,000,000. Within a period of less than 12 years the Rothschilds advanced in loans as follows: to England, $200,000,000; Austria, $50,000,000; Prussia, $40,000,000; France, $80,000,000; Naples, $50,000,000; Russia, $25,000,000; Brazil, $12,000,000; besides some $5,000,000 to smaller states; or, altogether, the then almost incredible amount of $462,000,000. The colossal financiering operations of the house are now conducted by the descendants of the above-mentioned brothers, and the firm has banking houses and representatives in all the leading cities of the civilized world.

ROTIFERA, in zoölogy, wheel-animalcules; a group of Metazoa which have been variously classified. Ehrenberg arranged them according to the peculiarities of their trochal disks, and Dujardin according to their methods of locomotion. They are now often made a class of Vermes, with four families, *Philodinidæ*, *Brachionidæ*, *Hydatineæ*, and *Flosculariadæ*. They are microscopic animals, contractile, crowned with vibratile cilia at the anterior part of the body, which, by their motion, often resemble a wheel revolving rapidly. Intestine distinct, terminated at one extremity by a mouth, at the other by an anus; generation oviparous, sometimes viviparous. The nervous system is represented by a relatively large single ganglion, with one or two eye-spots, on one side of the body, near the mouth, and there are organs which appear to be sensory. They are free or adherent, but never absolutely fixed animals.

ROTTERDAM, the chief port and second city of Holland; on the Nieuwe Maas or Meuse, at its junction with the Rotte; about 14 miles from the North Sea, with which it is also directly connected by a ship canal (Nieuwe Waterweg) admitting the largest vessels and not interrupted by a single lock. The town is intersected by numerous canals, which permit large vessels to moor alongside the warehouses in the very center of the city. These canals, which are crossed by innumerable drawbridges and swing bridges, are in many cases lined with rows of trees; and the handsome quay on the river front, 1¼ miles long, is known as the Boompjes ("little trees"), from a row of elms planted in 1615 and now of great size. Many of the houses are quaint edifices, having their gables to the street, with overhanging upper stories. The principal buildings are the town hall, court houses, exchange, old East India House, Boymans' Museum, containing chiefly Dutch and modern paintings, and the government dockyards and arsenal, besides the numerous churches, of which the most conspicuous is the Groote Kerk, or Church of St. Lawrence (15th century). The Groote Markt has a statue of Erasmus, a native of the town; and there are fine parks and a large zoölogical garden. Rotterdam contains shipbuilding yards, sugar refineries, distilleries, tobacco factories, and large machine works; but its mainstay is commerce. It not only carries on a very extensive and active trade with Great Britain, the Dutch East and West Indies, and other transoceanic countries, but, as the natural outlet for the entire basin of the Rhine and Meuse, it has developed an important commerce with Germany, Switzerland, and Central Europe. The Maas is crossed by a great railway bridge and another for carriages and foot-passengers. Rotterdam received town rights in 1340, and in 1573 it obtained a vote in the Estates of the Netherlands; but its modern prosperity

has been chiefly developed since 1830. Pop. (1919) 506,067.

ROTTI, an island in the Indian Archipelago, belonging to the Dutch; S. W. of Timor. It is 36 miles in length (650 square miles), and has a population of 80,000. The surface, though hilly, is nowhere more than 800 feet above the sea, and the fertile soil produces a rich vegetation.

ROTTLERA, a genus of *Euphorbiaceæ*. *R. tinctoria* is a tree very common in India, and occurring also in the Indian Archipelago, Australia, and Arabia. The three-lobed fruit is covered with a red mealy powder called in India kamala. As people in India occasionally paint their faces with the red powder, the tree itself is sometimes called the monkey-faced tree. It is used in the N. W. provinces of India for tanning leather. It yields a clear limpid oil, useful as a cathartic.

ROTUMAH, an island in the South Pacific, annexed to the Fiji Islands by Great Britain in 1881; distant about 300 miles N. N. W. from the nearest island of that group, of which it is a dependency; area, 14 square miles; pop. 2,300, all Christians.

ROUBAIX, a town of France, in the department of Nord; 6 miles N. E. of Lille; is a highly important seat of the French textile industry, remarkable for its rapid growth, most of it being not more than 50 years old. Woolens, cottons, and silk or mixed stuffs are chiefly made; also beet sugar, machinery, etc. During the World War it saw much fighting and suffered severely. Pop. about 122,000.

ROUBLE, the unit of the Russian money system. The silver rouble before the World War was equivalent to about 80½ cents in United States gold. Half and quarter roubles were coined in silver, also gold coins of nominally five roubles (demi-imperials) and three roubles (imperial ducats). Paper roubles are the principal money in circulation. Normally a paper rouble is worth about 49 cents. The rouble is divided into 100 kopeks.

ROUEN, a city of France, capital of the department of Seine-Inférieure, and formerly of the province of Normandy, on the Seine, 44 miles from its mouth, and 86 miles N. W. of Paris. It is situate on the right bank of the Seine, in a fertile, pleasant, and varied country. The streets, though in general straight, are narrow and dirty, and some of the houses are of wood. The most agreeable part of the town is that which adjoins the Seine. The public buildings of interest are, the cathedral, containing many old monuments, and one of the finest specimens of Gothic architecture in France; the Church of St. Ouen, likewise a fine Gothic building, situate nearly in the center of the town; and that of St. Maclou, considered a masterpiece of its kind. There are two bridges over the Seine, one of stone, another of iron, connecting the town with the suburb of St. Sever; also various literary societies and schools, an academy of belles-lettres, a society of agriculture and the arts, a central school, classes for medicine and surgery, a navigation and drawing school, together with a public library, a collection of paintings and natural history and a botanical garden. Manufactures cotton goods, woolens, linens, iron ware, paper, hats, pottery, wax, cloth, and sugar refineries. Dyeing, both of woolens and cotton, is also conducted with care and success. Rouen has frequently been taken and retaken. In 1419 it was taken by Henry V., and Joan of Arc was, in 1431, burned here. A statue to her memory has been erected on the spot. It is the birthplace of the two Corneilles, and of Fontenelle and Boieldieu. Pop. about 120,000.

ROUGE, in ordinary language, a cosmetic prepared from the dried flowers of *Carthamus tinctorius*, and used to impart artificial bloom to the cheeks or lips. Jeweler's rouge: an impalpable preparation of oxide of iron, obtained by gently heating the yellow oxalate of iron till it decomposes, carbonic acid escaping, and only a red powder being left. It is used for polishing silver, and for this purpose should be of the finest quality. Many cheaper varieties are sold under this name.

ROUGE ET NOIR (French, "red and black"), TRENTE-UN ("31"), or TRENTE ET QUARANTE ("30 and 40"), a modern game of chance, played by the aid of packs of cards on a table covered with green cloth.

ROUGET DE LISLE, CLAUDE JOSEPH, a French song-writer; born in Lons-le-Saulnier, France, May 10, 1760. He composed both words and music of "The Marseillaise," when he was an officer of engineers at Strasburg on the night of April 25, 1792. It first appeared under the title of "Song of the Army of the Rhine." He wrote several other fragments of songs, included in his "Fifty French Songs, Words of Various Authors, Set to Music by Rouget de Lisle" (1825); and other poems, stories, and plays, of but little merit. He died in Choisy-le-Roi, June 26 or 27, 1836.

ROUGH RIDERS. See ROOSEVELT, THEODORE; SPANISH-AMERICAN WAR.

ROULERS, or ROUSSELAERE, a city of Belgium, situated on the Mandelbeke, in West Flanders, 17 miles S. of Bruges. It was the scene of heavy fighting between the Allied forces and the Germans during the World War. Before the war it was an important industrial center, on account of its manufactories of textiles, especially linen. The population is about 25,000.

ROULETTE (French, "a little wheel"), a game of chance which from the end of the 18th century till the beginning of 1838 reigned supreme over all others in Paris. It continued to be played at German watering-places till 1872, when it ceased in terms of an act passed four years before. Roulette then found a home at Monaco. It is played on a table of an oblong form, covered with green cloth, which has in its center a cavity of a little more than two feet in diameter, in the shape of a punch bowl. This cavity, which has several copper bands round its sides at equal distances from each other, has its sides fixed, but the bottom is movable round an axis placed in the center of the cavity, the handle by which motion is communicated being a species of cross or capstan of copper fixed on the upper extremity of the axis. Round the circumference of this movable bottom are 38 holes, painted in black and red alternately, with the first 36 numbers, and a single and double zero; and these 38 symbols are also figured at each end of the table in order that the players may place their stakes on the chance they select. Along the margin of the table and at each end of it are painted six words—pair, passe, noir, impair, manque, rouge.

ROUMANIA. See RUMANIA.

ROUMELIA. See BULGARIA.

ROUNDERS, a game played by two parties or sides on a piece of ground marked off into a square or circle, with stations for a batter and bowler, and five bases or stopping-places at equal distances from each other and the batter's station. The object of the batter is to strike the ball as far as possible away with a short bat held in one hand, so as to be able to make a complete circuit of the ground, passing through each goal, or as far as any one of the goals, before the ball is returned by one of the fielders. A complete circuit of the ground made at once counts a run. The batter is out if the ball, after being hit by him, is caught by one of the fielders, or if he is struck by the ball thrown by a fielder while running between any of the goals. Also a rock-boring tool having a cylindrical form and indented face.

ROUNDFISH, the *Salmo* (*coregonus*) *quadrilateralis.* The specimen on which Sir John Richardson based his description was about 18 inches long. It is not highly prized for food.

ROUNDHEAD, a term applied by the Cavaliers or adherents of Charles I., during the Civil War of 1642, to the Puritans or adherents of the Parliamentary party, from their wearing their hair cut short, while the Cavaliers allowed their hair to fall onto their shoulders.

ROUND TABLE, KNIGHTS OF THE. See ARTHUR; MALORY, THOMAS; MORTE D' ARTHUR.

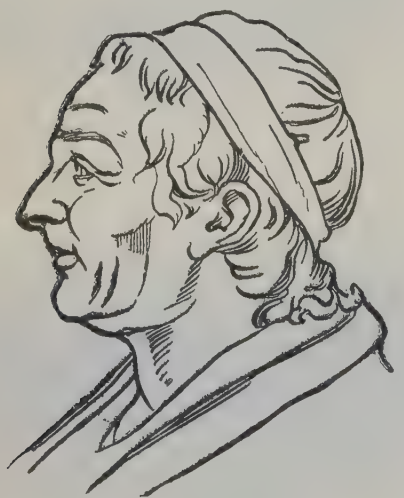
ROUND TOWERS, a class of tall narrow circular edifices, tapering somewhat from the base upward, and generally with a conical top, from 60 to 130 feet in height, and from 20 to 30 in diameter. With the exception of three in Scotland, they are peculiar to Ireland. The doors are from 6 to 20 feet from the ground, the windows small. The interior contained no stairs, but the successive stories were reached, like the doors, by means of ladders. Authorities are now pretty well agreed that these towers were the works of a Christianized race erected as places of refuge and as watch towers. They date from the 8th or 9th to the 13th century.

ROUP, one of the most serious diseases which the poultry or pheasant keeper has to fight, because in it there is generally an affection other than the mere cold which develops and makes it apparent. It is usually found that the system is scrofulous, which is the milder form; but sometimes it takes a diphtheritic development, and this is the most severe and deadly disease known to poultry keepers.

ROUSSEAU, HARRY HARWOOD, an American naval officer, born in Troy, N. Y., in 1870. He was educated at Rensselaer Polytechnic Institute, Troy, N. Y. After some years as draftsman and engineer for private companies, he was appointed a civil engineer in the United States Navy, with the rank of Lieutenant in 1898. From 1899 to 1903 he was an engineer in the bureau of yards and docks, Washington; from 1903 to 1907 engineer of public improvements, Mare Island Navy Yard, California; and in 1907 was appointed chief of the bureau of yards and docks with the rank of rear-admiral. From 1907 to 1914 he

was a member of the Isthmian Canal Commission. From 1914 to 1916, engineer of terminal construction, Panama Canal; from 1916 to 1920 a member of the commission of Navy Yards, and from 1917 to 1919 manager of the shipyard plants division, Emergency Fleet Corporation. He was also a director of the Panama Railroad Company, vice-chairman of the United States Shipping Board, and a member of several engineering societies.

ROUSSEAU, JEAN JACQUES, a Swiss-French philosopher, one of the most celebrated and influential writers of the 18th century; born in Geneva, Switzerland, June 28, 1712. He was the son of a watchmaker. For the first 35 years of his life the chief authority



JEAN JACQUES ROUSSEAU

is his own painfully frank, but perhaps not absolutely accurate "Confessions," first published in 1782 and 1789. After a desultory education he was apprenticed in 1725 to an engraver, from whose real or fancied severity he ran away in 1728. He now fell under the notice of Madame de Warens, a lady residing at Annecy, who sent him to a Roman Catholic institution at Turin, where he abjured Protestantism. After several fits of eccentric wandering he went to live with Mme. de Warens at Les Charmettes, a country house near Chambéry, where they appear to have lived happily together for nearly three years. From a short absence at Montpellier, however, Rousseau returned to find his place at Les Charmettes occupied by another, whereupon he departed to become a tutor at Lyons. In 1741 he went to Paris, and in 1743 obtained the post of secretary to the French ambassador at Venice. This office he resigned, and returned to Paris in 1745, to lead a precarious life, copying music and studying science. About this time he became intimate with Diderot, Grimm, D'Holbach, Mme. D'Épinay, etc., and contributed to the "Encyclopédie"; and from this period also dated his connection with Thérèse le Vasseur, with whom, 25 years later, he went through some form of marriage ceremony. In 1750 his essay, in which he adopted the negative side of the question whether civilization has contributed to purify manners, won a prize offered by the Academy of Dijon, and brought him for the first time into general notice. In 1752 he brought out a successful operetta (the music by himself), and soon after a celebrated "Letter on French Music."

In 1754 he revisited Geneva, where he was readmitted a free citizen on once more embracing Protestantism. Having returned to Paris he wrote a sort of novel, "Julia, or the New Héloïse," which was published in 1760, being followed by "The Social Contract" (Le Contrat Social), a political work, and "Émile, or on Education," another story, in 1762. The principles expressed in these works stirred up much animosity against their author. The confession of faith of the Savoyard vicar in Emile was declared a dangerous attack on religion, and the book was burned both in Paris and Geneva. Persecution, exaggerated by his own morbid sensibility, forced Rousseau to flee to Neufchâtel, then to the Ile St. Pierre in the Lake of Bienne, and finally to England, where he was welcomed by Hume, Boswell, and others in 1766. A malicious letter by Horace Walpole unluckily roused his suspicions of his English friends, and in May, 1767, he returned to France, where his presence was now tolerated. He lived in great poverty, supporting himself by copying music and publishing occasional works. In May, 1778, he retired to Ermenonville near Paris. His celebrated "Confessions" appeared at Geneva in 1782. Rousseau united an enthusiastic passion for love and freedom with an inflexible obstinacy and a strange spirit of paradox. The chief importance of his works lies perhaps in the fact that they contain the germ of the doctrines which were carried out with such ruthless consistency in the French Revolution. He died in Ermenonville, July 2, 1778.

ROUSSEAU, THEODORE, a French painter, born in Paris in 1812. His talent was well developed before he was 14 years of age. He identified himself

with a school of painting opposed to the prevailing classicism, and for a time met with bitter hostility from the officials of the French Academy. This continued until 1848, when by his pre-eminent skill as an artist he compelled recognition. From 1833 he spent his life chiefly at Barbizon, although he visited other parts of Europe. He was chiefly notable as a painter of landscapes, in which he excelled. His works are represented in most of the leading galleries, including the Metropolitan Museum, which has 13 examples. Rousseau died on Dec. 20, 1867.

ROVNO, a small city in Volhynia, Russia, but more important as a fort. It formed one of a triangle of forts, the other two being located at Lutsk and Dubno. Rovno was first fortified in 1887, and consisted of a system of seven forts in the form of a semi-circle, at a distance of from four to six miles from the city itself, and with a circumference of about twenty miles. During the early part of the World War Rovno served as the base of a Russian invasion of Austria-Hungary, until after the retreat of the Russian army, when it fell into the hands of the Germans. After the final defeat of Germany the forts again fell into the hands of the Russians. During the war between Soviet Russia and Poland, in the spring of 1920, the Poles attacked Rovno, and were reported to have taken it, but at the end of the campaign it was still in the hands of the Bolsheviki.

ROVUMA, a river of East Africa, which rises on the E. of Lake Nyassa, and flows nearly due E., with a course of about 500 miles, to the Indian Ocean. The Rovuma is not well adapted for navigation.

ROWAN, STEPHEN CLEGG, an American naval officer; born near Dublin, Ireland, Dec. 25, 1808; came to the United States when a boy, and on Feb. 1, 1826, was appointed a midshipman in the navy. He was promoted lieutenant, March 8, 1837; took part in the capture of Monterey and San Diego in the Mexican War, and, as executive officer of the "Cyane," in the bombardment of Guaymas. In the battle of La Mesa, Upper California, he commanded the naval battalion under Commodore Stockton, and was especially commended for his skill in leading the landing party that made a successful attack on a Mexican outpost near Mazatlan. He was promoted commander Sept. 14, 1855. At the outbreak of the Civil War he was on the "Pawnee," with which he engaged the Confederate battery at Acquia Creek on May 25, 1861; this being the first naval action of the war. He was promoted both captain and commodore, July 16, 1862, for gallantry in the Goldsborough expedition to North Carolina, and the engagements on Roanoke Island and Albemarle Sound. He forced the surrender of the forts at Newbern, N. C., and by the capture of Fort Mason restored National authority in the waters of North Carolina. He commanded the "New Ironsides" in the engagements with Forts Wagner, Gregg, and Moultrie; received a vote of thanks from Congress; and was promoted rear-admiral, July 25, 1866. After the close of the war Rear-Admiral Rowan was appointed to various executive offices; was promoted vice-admiral Aug. 15, 1870; and was chairman of the Lighthouse Board at the time of his retirement, Feb. 26, 1889. He died in Washington, D. C., March 31, 1890.

ROWE, LEO S., an American economist and public official, born in McGregor, Iowa, in 1871. He was educated at the Central High School of Philadelphia, University of Pennsylvania, and the University of Halle. He also received honorary degrees from several South American universities. From 1895 to 1896 he was instructor in municipal government, from 1896 to 1904 assistant professor of political science, and from 1904 to 1917 professor of political science at the University of Pennsylvania. He was a member of the commission to revise and compile the laws at Porto Rico (1900-1901); a United States delegate to the Third International Conference of American States at Rio Janeiro (1906); chairman of the United States delegation to the First Pan-American Scientific Congress, Santiago, Chile (1908); a member of the United States-Panama Joint Claims Commission (1913); secretary-general of the Pan-American Financial Conference at Washington, D. C. (1915); secretary-general of the International High Commission (1915–1917); a delegate to the Second Pan-American Scientific Congress (1915); secretary of the American-Mexican Joint Commission (1916–1917); assistant secretary of the treasury (1917–1920). In October, 1920, he became director-general of the Pan-American Union. He was a member of many domestic and foreign societies, and wrote: "Report of the Insular Code Commission" (with J. M. Keedy, 8 vols., 1902); "The United States and Porto Rico" (1904); "Problems of City Government" (1908); as well as many reports and articles in economic journals and reviews.

ROWE, NICHOLAS, an English dramatist and translator; born in Little Barford, Bedfordshire, England, June 30, 1674. He was educated at Westminster under Busby, and studied law in the Middle Temple; but early inheriting a small competency by the death of his father, he devoted himself to literature. Between 1700 and 1714 he produced eight plays, of which three were long popular: "Tamerlane" (1702); "The Fair Penitent" (1703); "and "Jane Shore" (1714). The character of Lothario in "The Fair Penitent" was the prototype of Lovelace in Richardson's "Clarissa Harlowe," and indeed the name is still the proverbial synonym for a fashionable rake. Rowe translated Lucan's "Pharsalia." His edition of Shakespeare (6 vols. 1709-1710) at least contributed to the popularity of his author. His comedy, "The Biter" (1705), failed. The Duke of Queensberry made him under-secretary of state; in 1715 he succeeded Tate as poet-laureate; the same year he was appointed one of the surveyors of customs to the port of London; the Prince of Wales made him Clerk of his Council; and the Lord Chancellor Parker clerk of Presentations in Chancery. He died Dec. 6, 1718, and was buried in Westminster Abbey.

ROWELL, NEWTON WESLEY, a Canadian lawyer. He was born in Middlesex co., Ont., in 1867, and was educated in the public schools and Ontario Law Society. He was called to the bar in 1891 and eventually became head of the law firm of Rowell, Reid, Wood & Wright, Toronto. He became bencher of the Law Society in 1911 and liberal member of the Ontario Legislative Assembly for North Oxford. He was leader of the liberal opposition in the Ontario Legislature, 1911-17, and in 1918 became a member of the Imperial War Cabinet. He became president of the Privy Council of Canada in 1917.

ROWING, the propulsion of a boat by oars. Fresh water rowing is, of course, carried on primarily by individuals as a means for exercise or as a form of pleasure. Rowing, however, has also developed extensively as a sport, with competitive races between highly trained crews, mostly of amateurs. These crews consist most frequently of eight men, although crews of four and of two are also used. Professional rowing is practically exclusively single sculling. The styles of rowing, as well as the styles of boats used differ with place and time, and each particular style has its adherents. Racing boats are light, long, and narrow. In England the eight-men crew is seated in such a manner that each man sits as far away from his rowlock as possible, resulting in an arrangement which leaves four men on each side. In America, however, all eight men sit in a straight line down the center of the boat. The steering in an eight-crew boat is done by a coxswain, sitting in the stern and guiding the boat by means of tiller ropes, attached to the rudder. In a four-crew boat the steering, however, is usually done by the first rower from the stern by means of a board to which the rudder lines are attached and which is worked with his feet. No rudder is used in a two-crew boat.

The actual propulsion of the boat is accomplished by whatever the oar does while in the water. Rowing boats, of course, have undergone considerable development and modern boats are provided with every possible means of increasing the speed and of lessening the strain on the rower. The most important developments are the addition of light iron brackets (outriggers) which have been universally adapted and which increase the power of the stroke. Modern rowing styles are based practically exclusively on the requirements of keelless boats, the first of which was built in 1856, in England. In 1870 the sliding seat was introduced by Yale and after it was improved in various ways, it has been adopted both in England and in America. In England fixed rowlocks are used, whereas in America they work on a swivel. The most frequently used wood for boats is cedar. American oars are lighter and wider than English oars.

The most important American rowing competitions are the following: varsity races of eight-crew boats between Yale and Harvard, instituted in 1852 and in recent years held at New London, Conn. In 1920 this race was won by Harvard. The inter-collegiate regatta is rowed at Poughkeepsie, N. Y., on the Hudson, since 1901. The American Association of Amateur Oarsmen, founded in 1871, holds annual championship regattas for all kinds of crews. The American Henley regatta is held on the Schuylkill river, Philadelphia, and so is the annual People's regatta. The Middle States annual regatta is held on the Harlem river, New York City. Famous foreign regattas are the English Henley on the Thames, the Oxford-Cambridge regatta, and the Royal Canadian Henley. The most famous international rowing contest is the regatta held in connection with the Olympic games. In 1920 this was held on the Grand Canal course near Brussels. United States oarsmen were entered in four out of five events, winning three and finishing second in one. American crews also frequently

participate in the English Henley, and specially arranged races have been held between American and English college crews.

Rowing is a major sport in most of the larger American universities. There are also many rowing clubs of different types throughout the country.

ROWLAND, HENRY COTTRELL, an American novelist, born in New York in 1874. He was educated privately and carried on special studies in surgery at the Polyclinic Hospital in New York. During the Spanish-American War he served as a naval seaman, and in 1899-1900 was assistant surgeon in the Philippines. In 1914-15 he served as physician in France. During the World War he acted also as war correspondent for "Collier's Weekly" and was a special agent of the intelligence department of the United States Navy. He was the author of "Sea Scamps" (1903); "The Wanderers" (1905); "In the Service of the Princess" (1909); "The Closing Net" (1912); "Filling His Own Shoes" (1914). He was a frequent contributor of stories to magazines.

ROXBURGH, a county of southeast Scotland, near the English border. Area, 665 square miles. It is mainly agricultural and is fertile, farming, sheep-raising and market gardening being the chief industries. It is watered by the River Tweed, and the Cheviot and Lauriston hills rise up on the horizon, with lakes and streamlets to vary the scenery. Jedburgh is the capital, and a chief town is Hawick. Pop. about 50,000.

ROYAL ACADEMY, THE. See ACADEMY OF ARTS, THE ROYAL.

ROYAL ARCANUM, a fraternal, beneficiary and secret society in the United States. The head offices are in Boston, where the society was formed in 1877 and where accommodation is provided for the sessions of the Supreme Council. The organization is based on the subordinate councils which number about 2,000, spread over the United States, and are grouped under State or grand councils, the representatives of which make up the governing body. The membership is around 250,000 and consists only of male adults. The beneficiary work of the society is that which receives its chief attention and a reorganization of its insurance system entailing an increase in the amount of premiums payable has occasionally been found necessary. The benefits paid to members from the date of the establishment of the society to September, 1920, total nearly $215,000,000.

ROYAL FLYING CORPS, British, the military branch of the British Air Forces. The Royal Flying Corps was organized in 1912 in England in response to a demand that the importance of aëronautics be recognized by forming a special branch devoted to aviation in the British military service. From the date of its origin, with Major Seely as its first commandant, the Royal Flying Corps showed a remarkable progress in expansion and personnel. Starting with a total enlisted force of less than one thousand officers and men, it became, even in the early years of the World War, one of the most efficient and highly organized branches of the service. At the close of the World War, its enlistment numbered well over three hundred thousand, including the ground service and mechanics. In 1916 the Royal Flying Corps, while preserving its name and organization unchanged, became, by inclusion, a division of the Royal Air Service, which included the naval, dirigible, kite balloon, and blimp branches of the aviation service. The Royal Flying Corps was recruited principally from Great Britain, the Dominion of Canada, Australia and the United States. The commander-in-chief of the Allied Forces complimented the service for the invaluable aid that it offered at the Somme, Vimy, Messines and Ypres, where it distinguished itself equally as a fighting unit and as an essential factor in the success of the ground operations.

ROYAL GEOGRAPHICAL SOCIETY, a British association founded in 1830, having for its object the promotion and diffusion of geographical science. The members of the society had originally been a group of travelers and explorers who formed the Raleigh Dining Club. Lectures were delivered at the meetings and the latest results of scientific research in geography were committed to the "Royal Geographical Journal," which was the organ of the club. In 1859 the association was chartered, and in 1882 its journal began to bear the title of "Proceedings of the Royal Geographical Society," and "Monthly Record," changed again in 1893 to "Geographical Journal." The society has a large library and issues a year book and other geographical literature. It has also financed several expeditions having geographical research as their object.

ROYAL INSTITUTION, an institution founded in London, England, by Count Rumford, Sir Joseph Banks, etc., March 9, 1799, and incorporated Jan. 13, 1800. It was reconstituted in 1810. It is designed to diffuse knowledge, to facilitate the general introduction of mechan-

ical inventions, and teach by lectures and experiments the application of science to the common purposes of life. It has, as a rule, had for its lecturers some of the first scientific men of the age: *e. g.*, Thomas Young, Davy, Brande, Faraday, Tyndall, Frankland, and Rayleigh. It maintains professors of natural philosophy, chemistry and physiology, and has laboratories (including, since 1896, the Davy-Faraday research laboratory presented by Dr. Ludwig Mond).

ROYAL OBSERVATORY, GREENWICH, the famous English observatory founded by Charles II. in 1675. The first observation was made Sept. 19, 1675. The Director of the Observatory is styled the Astronomer Royal, and is under the official control of the Admiralty, but receives his appointment directly from the Prime Minister, and holds office by warrant under the royal sign manual. Meridian observations of sun, moon, planets and stars constitute the fundamental work. Photographs of the sun are taken on every available day, and after being measured are carefully stored for reference. Magnetic and meteorological observations, made continuously, form an important branch of the works. The chronometers used in the English navy are purchased, and generally examined, at the Observatory. Hourly and daily time-signals are sent out from the Observatory through the post-office telegraphs giving Greenwich time to all parts of the country.

ROYAL SOCIETY (LONDON), a society for prosecuting research in general and physico-mathematical science in particular, founded in 1660. Its first journal opened Nov. 28, 1660, and the members, in 1662, obtained a charter, and were incorporated as the Royal Society. The first number of the "Philosophical Transactions," recording the work of the society, appeared on March 6, 1665. After 1750 the annual volume took the place of occasional numbers. In 1709 a bequest from Sir Godfrey Copley led to the establishment of the Copley gold medal, and a donation from Count Rumford in 1796 resulted in the foundation of the Rumford gold and silver medals. Two more medals were established by George IV. in 1825. The Linnæan Society branched off from it in 1788, the Geological Society in 1807, and the Royal Astronomical Society in 1820. For a considerable time the number of the members stood at 600; latterly, however, only 15 members have been annually elected, so that the number of fellows will in a few years be reduced below 500.

Many of the most important scientific achievements and discoveries have been due to its enlightened methods. It deservedly enjoys an influential and semi-official position as the scientific adviser of the British Government, and not only administers the $20,000 annually voted by Parliament for scientific purposes, but has given suggestions and advice which have borne valuable fruit, from the voyage of Captain Cook in the "Endeavor" in 1768 down to the present time. The roll of the Royal Society contains practically all the great scientific names of its country since its foundation. Among its presidents have been Lord-Chancellor Somers, Samuel Pepys, Sir Isaac Newton, Sir J. Banks, Sir Hans Sloane, and Sir Humphry Davy.

ROYAL SOCIETY OF LITERATURE, a society founded in England under the patronage of George IV., in 1823, and chartered in 1826. It awards gold medals.

ROYCE, JOSIAH, an American educator and author; born in Grass Valley, Cal., Nov. 20, 1855. He became Professor of the History of Philosophy in Harvard in 1892, and published: "A Primer of Logical Analysis" (1881); "The Religious Aspect of Philosophy" (1885); "California" (1886); "The Feud of Oakfield Creek" (1887), a novel; "The Spirit of Modern Philosophy" (1892); "Studies of Good and Evil" (1898); "The World and the Individual" (1900); "The Conception of Immortality" (1900); "Herbert Spencer" (1904); "The Philosophy of Loyalty" (1908); "William James; and Other Essays" (1911); "Problems of Christianity" (1912); "War and Insurance" (1914); "The Hope of the Great Community" (1917). He died Sept. 14, 1916.

ROYE, a village in the Department of the Somme, France, situated on the Avre, 26 miles S. E. of Amiens. The village was taken by the Germans soon after the invasion of France, in September, 1914, but afterward was the scene of much of the heavy fighting in that region. Pop. about 4,500.

ROYER-COLLARD, PIERRE PAUL, a French statesman; born in Sompuis, France, June 21, 1763. On the outbreak of the Revolution he was elected a member of the municipality of Paris, and in 1790-1792 acted as joint-secretary. Having incurred the enmity of the Jacobins, he lived in hiding at Sompuis during the Reign of Terror. Three years afterward (1797) chosen to the Council of the Five Hundred, he took an active part in the work of that assembly, till the 18th Fructidor. In 1811

he was appointed Professor of Philosophy in Paris, and exercised an immense influence on the philosophy of France. Rejecting the purely sensuous system of Condillac, he gave special prominence to the principles of the Scotch school of Reid and Stewart. Strongly "spiritualist" as opposed to materialism, he originated the "Doctrinaire" school, of which Jouffroy and Cousin were the chief representatives. He was appointed president of the Commission of Public Instruction in 1815, but resigned that post in 1820; in 1825 also he returned to political life as deputy for the department of Marne. The French Academy opened its doors to him in 1827; and in 1828 he was named president of the Chamber of Representatives, and in that capacity presented the address of the 221 deputies (March, 1830) withdrawing their support from the government, which the king refused to hear read. Next day the Chamber was prorogued. From 1842 Royer-Collard completely withdrew from public life. His salon was latterly the resort of such men as Cousin, Guizot, De Broglie, Casimir Périer, Villemain, De Rémusat, and others. He never was a writer, and he became a philosopher only by accident; his true interest in life was politics, his real eminence as a political orator after the ancient pattern rather than that of the modern parliamentary debater. He died in his country seat, Châteauvieux, near St. Aignan, Loir-et-Cher, Sept. 4, 1845.

ROYLE, EDWIN MILTON, an American dramatist and actor, born at Lexington, Mo., in 1862. He graduated from Princeton in 1883 and took post-graduate courses at the University of Edinburgh. He studied law but did not practice. His first play, "Friends," was produced in 1892. This was followed by "The Squaw Man," "The Struggle Everlasting," "The Silent Call," "The Unwritten Law," "Peace and Quiet," and "The Longest Way Round."

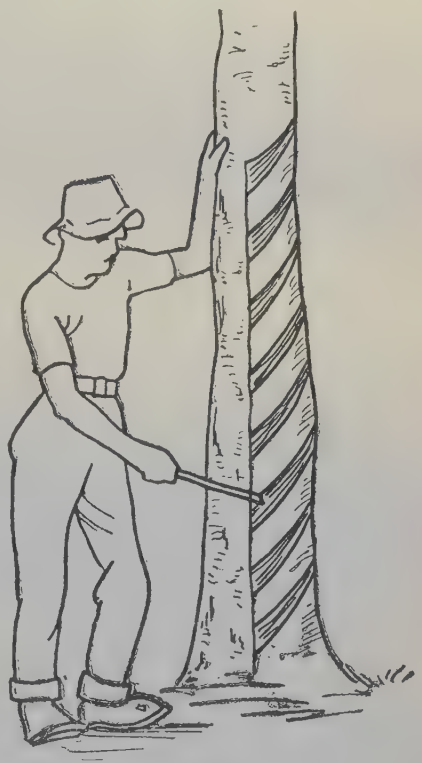
ROYSTON CROW, the common English name for the hooded crow, *Corvus cornix*. See CROW.

ROZHDESTVENSKY, ZINIVY PETROVITCH, a Russian naval officer, born in 1848. During the Russo-Turkish War he served as a lieutenant. He rose through the various grades, becoming admiral in 1904. He was placed in command of the Baltic fleet which was dispatched to the Far East. (See RUSSO-JAPANESE WAR.) He was defeated by the Japanese fleet under Admiral Togo in the battle of the Sea of Japan, in May, 1905. During this action he was taken prisoner. He was tried by court-martial on his return to Russia, but was acquitted of blame. He died in 1909.

RUATAN, or ROATAN, an island of Central America, in the Bay of Honduras; area, about 240 square miles. Surface, somewhat elevated and well wooded; soil, fertile. The shores abound in fish and turtles, and near the S. extremity is a good harbor.

RUBACE, or RUBASSE, in mineralogy: (1) Rock crystal from Brazil, inclosing red scales of hæmatite or göthite. (2) Rock crystal which, when heated and plunged into a cool colored solution, becomes fissured and admits the red coloring matter. (3) Rubicelle. (4) Rose-quartz.

RUBBER, known also as India Rubber, or Caoutchouc, a substance of increasing use in the arts and industries for its



RUBBER

Method of Cutting the Rubber Tree to Collect the Sap.

combination of qualities. In chemistry rubber is a hydrocarbon with the formula $C_{10}H_{16}$, and is soluble only in carbon disulphide, carbon tetrachloride, and in volatile oils such as ether, turpentine, etc.,

the product is yielded from the stems of trees of Hevea, Manihot, Ficus, Castilloa and Funtumia, from the guayale plant Parthenium, and from the climbers, roots and leaves of other trees. These trees and plants grow in equatorial regions, some of them requiring a stony soil with an occasional rainfall and others a moist alluvial soil. Rubber is found in a solid state in the fiber of the Parthenium, and extraction from this shrub is easy. In the case of the other plants and trees the extraction of the product is more complicated. The calls of industry and commerce have used up enormous supplies of rubber in recent years, but heavy as the demand has been, the sources have shown no signs of exhaustion. In Ceylon and Malaya, Sumatra, Brazil, Bolivia, Peru, and in other areas of South America, and the E., the cultivation of rubber has continually extended. Until recently the product harvested in the State of Para in Brazil was looked upon as the best in quality and the standard by which other grades of rubber were judged, but more recently the product from the East has improved both in quantity and quality. In 1900 very little plantation rubber could be found in the markets, yet in 1915 the amount exported from Ceylon and Malaya alone was nearly 100,000 tons. The United States is the largest importer and consumer of rubber among the nations. In 1904, 59,016,000 pounds were imported, and in 1915, 172,068,428 pounds.

The use of rubber goes back almost to the period of the voyages of Columbus, for according to the accounts of that time, Columbus brought back to Spain rubber balls from Haiti; and in 1615 Juan de Torquemada talks of rubber trees, and of the use of the gum in the making of shoes and waterproofing of canvas. The name of India rubber seems to have come into vogue about the middle of the eighteenth century, when the product began to be attached to the end of pencils to rub out pencil marks. From that time onward rubber gradually came into use for one purpose or another all over the civilized world.

Rubber in its crude state is obtained from the juice of the rubber tree, ranging from the Hevea brasiliensis, flourishing in the Amazon valley, to the tropical African variety which gives the rubber of commerce associated with that region. It is a fortunate fact that the milky juice of the tree which is the essence of rubber does not appear to be an element in its sap nor essential to its life, so that even unskillful harvesting is not fatal to the tree itself. The juice or latex is in its nature a secretion in which float small globules of rubber which when the juice is permitted to stand for a given time comes to the top like cream. A tree may in the course of the year yield up to 17 pounds. Before the scientific cultivation of rubber had been developed it was customary to cut the trees and saplings down and in that way procure the caoutchouc wholesale, but the method now in vogue, having in view the prolongation of the life of the tree, eliminates wastefulness. The modern method is to make incisions in the trunk through which the rubber is drawn into clay cups held by the workers. The contents of the cups are later emptied into a large vessel, which is heated moderately so that the water may evaporate and the rubber harden into cakes ready for shipping. This is the method in vogue in the plantations where the best rubber of commerce is drawn.

In recent years botany and the allied sciences have lent their aid in the development of rubber cultivation. Waste has now been reduced to a minimum and even where the trees have been cut down methods of transplantation have been evolved. The method of collection is usually through an incision made to resemble a herringbone, with a vertical channel toward which a series of oblique cuts have been made with the cup at the base to receive the fluid as it descends.

The many uses to which natural rubber showed itself capable of being put naturally turned the thoughts of those who used it to the possibility of manufacturing rubber and experiments in that line were made from the beginning. One of the first uses to which rubber was put in manufacture was in waterproof cloth, and as flexible tubes and containers. Rubber boots were imported in 1852 into Boston from Brazil. A little before 1844 Charles Goodyear discovered the art of vulcanizing and this, with the discovery of Hayward that by mixing dry sulphur with rubber its stickiness was removed, added greatly to the commercial possibilities of the product. New methods of vulcanizing rubber were gradually perfected, so that it became unchangeable under all ordinary conditions whether of heat, cold or moisture. When hardened by cold it does not become brittle. When subjected to heat or put in boiling water it does not dissolve but becomes more elastic. When kept stretched to many times its original length, it can be cut into elastic threads to be used in garters, gloves, etc. In a semi-liquid state it may be used as a cement, and combined with shellac and coal tar, it forms a tenacious variety of glue. It is used as an element in varnish, and in many lubricating liquids. Apart from the making of tires, footwear, clothing, belting, surgical and

medical apparatus, rubber is increasingly used in articles of commerce both in the hard rubber and soft rubber state. One of its most valuable uses is as an adjunct to the electrical industry in which it is found of great service as an insulating material.

RUBBLE, a common kind of masonry, in which the stones are irregular in size and shape. Walls faced with ashlar are generally packed with rubble at the back. Rubble is of various kinds, according to the amount of dressing given to the stones. Common rubble is built with stones left almost as they come from the quarry. Hammer-dressed rubble is so called when the stones are squared with the mason's hammer; coarsed rubble, when the stones are squared and equal in height, etc.

RUBEFACIENTS, external agents employed in medicine for the purpose of stimulating, and consequently reddening, the part to which they are applied. All agents which, after a certain period, act as blisters may be made to act as rubefacients, if their time of action is shortened. The mildest rubefacients are hot poultices, cloths soaked in very hot water, moderately stimulating liniments—as, for example, soap-liniment, with various proportions of liniment of ammonia, or chloroform, etc. Spanish fly, in the form of *Emplastrum Calefaciens*, or warm plaster, in which the active ingredient is blunted by the free admixture of soap plaster, resin plaster, etc., is a good form of this class of agents. Capsicum or cayenne pepper, in the form of a poultice, is an excellent rubefacient; it is much used in the West Indies. Mustard, in the form of *Cataplasma Sinapis*, or mustard poultice, and oil of turpentine are perhaps the best of the ordinary rubefacients. The best method of employing turpentine is to sprinkle it freely on three or four folds of clean flannel wrung out of boiling water. The sprinkled surface of this pad is placed on the skin, and a warm dry towel is laid over the flannel.

RUBELLITE, in mineralogy, a red variety of TOURMALINE (*q. v.*), occurring in crystals mostly transparent and containing lithia.

RUBENS, PETER PAUL, a distinguished Flemish painter; born in Siegen, Westphalia, June 29, 1577. When he was 10 years old, his mother, then a widow, returned to her native place, Antwerp. He received an excellent education; and after studying in his own country, especially under Otto Van Veen, he went to Italy, where he improved himself by copying the works of the best masters, but chiefly Titian. While in Italy he was employed by the Duke of Mantua, not only as an artist, but on an embassy to Madrid. He returned to Antwerp in 1608, and was soon after made court painter to the Archduke Albert, Spanish governor of the Low Countries. In 1620 he was employed by the Princess Mary de Medici to adorn the gallery of the Luxembourg with a series of paintings illustrative of the principal scenes of her life.

PETER PAUL RUBENS

While thus engaged he became known to the Duke of Buckingham, who purchased his museum. He was afterward employed by the Infanta Isabella and the King of Spain in some important negotiations which he executed with such credit as to be appointed secretary of the privy council. He acquired immense wealth, and was twice married, the second time, in 1631, to a lovely girl of 16. Rubens, beyond all comparison, was the most rapid in execution of all the great masters, and was incontestably the greatest perfector of the mechanical part of his art that ever existed. His works are very numerous, and very diversified in subject. There are nearly 100 in the Picture Gallery at Munich. "The Descent from the Cross," at Antwerp, is perhaps his masterpiece. He died in Antwerp, May 30, 1640.

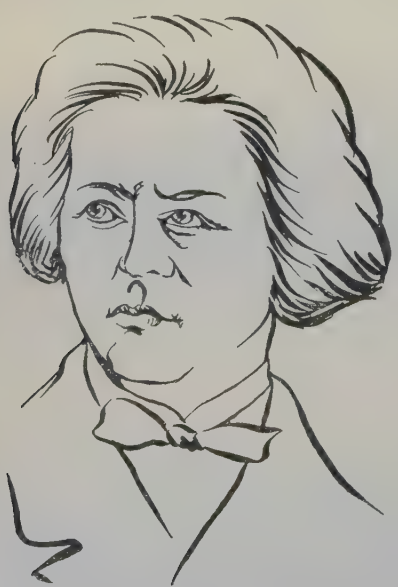
RUBIACEÆ, an order of plants founded by Jussieu in 1759; monopetalous plants, with opposite leaves, interpetiolar stipules; stamens inserted in the tube of the corolla, and alternating with its lobes; ovary inferior, compound.

RUBICON, a river in north Italy (now the Fiumicino, a tributary of the Adriatic), famous in Roman history, Cæsar having by crossing this stream (49 B. C.), at that time regarded as the N. boundary of Italy, finally committed himself to the civil war. Hence the

phrase "to pass the Rubicon" is to take the decisive step by which one commits one's self to a hazardous enterprise.

RUBIDIUM, a metal much resembling cæsium, with which it was discovered in 1860, by Bunsen and Kirchoff, during the analysis of a spring of water which contained these metals in minute quantities. Rubidium has since been found in small quantities in other mineral waters, in lepidolite, and in the ashes of many plants. This metal is closely related, in properties, to potassium, but is more easily fusible and convertible into vapor, and actually surpasses that metal in its attraction for oxygen, rubidium taking fire spontaneously in air. It burns on water with exactly the same flame as potassium. Its oxide, rubidia (RbO), is a powerful alkali, like potash, and its salts are isomorphous with those of potash.

RUBINSTEIN, ANTON GREGOR, a Russian musician; born in Wechwotynez, Kherson, Nov. 28, 1829. He was trained to music in Moscow by his mother and a master. Liszt heard him, "an infant



ANTON GREGOR RUBINSTEIN

prodigy," play in Paris in 1840, recognized his genius, and encouraged him to play in other cities. After some further "touring" he gave himself to serious study in Berlin and Vienna, and in 1848 settled in St. Petersburg as teacher of music. In 1854 he made another musical tour. On his return to St. Petersburg he succeeded in getting a musical conservatory founded (1862) there and became its director. But his concert tours engrossed a good deal of his time, and in 1867 he resigned the directorship of the conservatoire. In 1872 he went to the United States and had an enthusiastic reception. He ended his concert tours in 1886. He was induced in the following year to resume the directorship of the conservatory at St. Petersburg. From the Russian Government he received a patent of nobility and other honors.

He was a strongly pronounced opponent of the principles of Wagner. As a pianist he held the highest rank, being usually reckoned the greatest since Liszt.

Among his best musical productions are the operas: "The Maccabees," "The Demon," "Feramors" (the libretto from Moore's "Lalla Rookh"), and "Kalaschnikoff"; the two symphonies: "Ocean" and "Dramatic"; and the sacred operas: "Paradise Lost," "The Tower of Babel," and "Sulamith." His numerous songs and pieces of chamber music are highly esteemed and more widely known. He wrote his "Autobiography" (1839-1889) and "Conversation on Music." He died in St. Petersburg, Russia, Nov. 20, 1894.

RUBLEE, GEORGE, an American lawyer and public official, born in Madison, Wis., in 1868. He graduated from Harvard in 1890, from the Harvard Law School in 1895 and in 1896 became instructor in that school. After practicing for one year in Chicago, he removed to New York in 1898. He was appointed a member of the Federal Trade Commission in 1915, and in 1916 was appointed to report on the operation of the Adamson 8-hour law. In 1917 he was appointed a member of the Commercial Economy Board by the Council of National Defense, and in the same year acted as special counsel for the Treasury Department. He represented the United States Shipping Board, and the Emergency Fleet Corporation on the priorities committee of the War Industries Board, in 1917. In 1918-19 he was American delegate to the Allied Maritime Transport Council in London.

RUBRIC, in the language of the old copies of MSS. and of modern printers, any writing or printing in red ink; the date and place in a title-page being frequently in red ink, the word rubric has come to signify the false name of a place on a title-page. Thus, many books printed at Paris bear the rubric of London, Geneva, etc.

In law, the title of a statute; so called as being formerly written in red characters. Also, in MS. missals, the direction prefixed to the several prayers and offices formerly written in red;—hence,

an ecclesiastical or episcopal injunction; also the rubric familiarly signifies the order of the liturgy in the Roman Catholic and Protestant Episcopal Churches. Hence, that which is definitely fixed or authoritatively established; as, the rubric of the planetary system.

RUBUS, a genus of *Potentillidæ* (Lindley); of *Rubeæ* (Sir Joseph Hooker); creeping herbs or sarmentose shrubs, almost always prickly; flowers in panicles or solitary, white or red. Fruit of several single-seeded juicy drupes, in a protuberant fleshy receptacle; known species about 100, chiefly from the north temperate zone. In North America the leaves of *R. villosus* are employed as an astringent. The leaves of *R. arcticus* have been used as a substitute for tea. Several Himalayan species or sub-species have edible fruits.

RUBY, a term applied popularly to two distinct minerals—the pyrope and the spinelle ruby, both of which are much valued as gems. The pyrope is a silicate of magnesia and alumina, with varying admixtures of iron, chromium, manganese, and lime. It occurs chiefly at Zöblitz, in Saxony; at Mittelgebirge, in Bohemia; and at Elie, in Scotland. The spinelle ruby and its varieties, the orange-red rubicelle, and the violet or brown almandine, are aluminates of magnesia, with different proportions of iron and chromium. They mostly occur in Ceylon at Ava and in other parts of the East Indies. Rubies are wonderfully imitated.

RUBY THROAT, the *Trochilus colubris*, a species of humming bird, so named from the brilliant ruby red color of its chin and throat. In summer it is found in all parts of North America up to lat. 57° North.

RUDDER, primarily, an oar; specifically the instrument by which a ship is steered, being that part of the helm which consists of a piece of timber which enters the water, and is attached to the sternpost by hinges, on which it turns.

RUDDER FISH, *Caranx Carangus;* a fish allied to the mackerel, very common in the Atlantic and Pacific Oceans, so named from its habit of swimming around the sterns of ships, attracted, doubtless, by the refuse thrown overboard. The flesh is said to be coarse in flavor.

RUDINI, ANTONIO STARRABBA, MARQUIS DI, an Italian statesman; born in Palermo, Sicily, in 1839. He became prominent as mayor of Palermo, where he vigorously suppressed an insurrection. Though an aristocrat, he sided with Garibaldi. In 1869 he was minister of the interior and member of the Chamber of Deputies, serving in the Parliament till called to succeed Crispi as premier, Feb. 7, 1891. During the Mafia difficulty in New Orleans he recalled the Italian minister from Washington to enforce his demands on the United States Government. He succeeded Crispi in 1891, was succeeded by Giolitti in 1892, and was again made premier in 1896, when disasters to the Italian army in Abyssinia caused Crispi's fall. His third term of office closed June 29, 1898. He died Aug. 6, 1908.

RUDOLF I., or **RUDOLPH**, founder of the former imperial dynasty of Austria; born in Limburg castle in the Breisgau, Germany, May 1, 1218. He became a warm partisan of Frederick II., distinguished himself in arms, and spent much of the early years of his manhood in quarrels with the bishops of Basel and Strasburg. His possessions were greatly increased by inheritance and by his marriage, till he was the most powerful prince of Swabia. In 1273 the electors chose him to be German king; as, never having been crowned by the Pope, he was not entitled to be called kaiser or emperor. His accession was opposed by none; the Pope's consent was secured at the price of certain rights already parted with by Rudolf's predecessors. Ottocar of Bohemia, rebelling against him, was defeated and slain in 1278 at Marchfeld beside the Danube. Rudolf spent the greater part of his life that remained in suppressing the castles of the robber knights and putting an end to their lawless practices. He died in Spires, July 15, 1291, and was buried in the cathedral there.

RUDOLF II., eldest son of the Emperor Maximilian II.; born in Vienna, July 18, 1552; he was educated at the Spanish court by the Jesuits; made King of Hungary in 1572, King of Bohemia, with the title King of the Romans, in 1575, and on the death of his father in 1576 succeeded to the imperial crown. Gloomy, taciturn, bigoted, indolent both in body and mind, he put himself in the hands of the Jesuits and low favorites and left the empire to govern itself. His attention was given to his curiosities, his stable, his alchemical and magical studies; nevertheless his taste for astrology and the occult sciences, and his desire to discover the philosopher's stone, made him extend his patronage to Kepler and Tycho Brahe. The astronomical calculations begun by Tycho, and continued by Kepler, known as "The Rudolphine Tables," derive their name from this emperor. Meanwhile the Protestants were bitterly persecuted by the Jesuits throughout the empire; the Turks invaded Hungary and defeated the Archduke Maximilian (1596); Transylvania and

Hungary rose in revolt; and at last Rudolf's brother Matthias wrested from him the crowns of Hungary and Bohemia, and

RUDOLF II.

the states of Austria and Moravia. Less than a year after losing the crown of Bohemia he died, unmarried, Jan. 20, 1612, and was succeeded by Matthias.

RUDOLPH, an Austrian Archduke, son of Francis Joseph I., born in 1858. He was carefully educated and entered the army at the age of twenty, but distinguished himself as a traveler and writer. In 1881 he married Stephanie, daughter of King Leopold II., of Belgium. In 1889 he became the subject of a great deal of romantic interest, because of his death in a hunting lodge in the royal preserves, at Myerling, near Vienna. He had obviously committed suicide, the rumored cause being his love for an actress, but this phase of the scandal was suppressed. Archduke Rudolph was one of the most accomplished members of the Imperial family. He was the author of "Fifteen Days on the Danube" (1881); "A Trip to the Orient" (1884); and planned and partly edited the monumental work "The Austrian-Hungarian Empire through Word and Picture" (1886-1902).

RUDOLSTADT, Germany, capital of the former principality of Schwarzburg-Rudolstadt (now part of the federated State of Thuringia), situated on the Saale, 18 miles S. of Weimar. It is famous for its manufacturies of fine porcelains, pianos, toys and chemicals. Pop. about 13,000.

RUE, the genus *Ruta.* The common rue is *R. graveolens,* a half-shrubby plant, of a fetid odor and an acrid taste. The bluish-green leaves are pinnate, the flowers yellow; a native of southern Europe, but grown in gardens in the East and West Indies, the United States, etc. Rue oil is a powerful topical stimulant, an anti-spasmodic and an emmenagogue. It is used internally in flatulent colic, hysteria, epilepsy, etc., and as an enema, and externally as a rubefacient.

RUFF, the *Machetes pugnax,* a bird that is a spring and summer visitor in north Europe, having its winter home in Africa. It is rather larger than a snipe; general plumage ash-brown, spotted or mottled with black, but no two specimens are alike. In the breeding season the

RUFF

neck is surrounded by a frill or ruff of numerous long black feathers, glossed with purple, and barred with chestnut. While probably serving primarily as an attraction to the hen birds, this frill acts also as a shield, when furious battles take place between them for the possession of the females, which are called reeves. The nest is usually of coarse grass, in a moist, swampy place; the eggs four in number. Also a breed of the Jacobin.

RUFFE, in ichthyology, the *Acerina cernua,* from the rivers of Europe. It is olive-green, marbled and spotted with brown, and resembles the perch in habits. The name is said to be derived from the harsh sensation caused by its ctenoid scales.

RUFFED GROUSE, *Bonasa umbellus,* a North American species of grouse of the same genus as the hazel grouse of Europe. It is named from the tufts of

feathers on the sides of its neck, and frequents forests and thickets.

RUFIJI, or **LUFIJI**, a river of eastern Africa which rises to the N. E. of Lake Nyassa, and enters the Indian Ocean opposite the island of Mafia.

RUGBY, a town in Warwickshire, England; 83 miles N. W. of London and 30 E. S. E. of Birmingham. At the foot of the hill on which it stands the Swift gave John Wyclif's ashes to the Avon; close by, at Ashby and at Dunchurch, the Gunpowder Plot was hatched; the battlefield of Naseby was visited by Carlyle from its school house in 1842, a few days before Arnold's death; it is within a drive of Stratford-on-Avon, Coventry, and Kenilworth. It is the center of a great hunting district and the seat of a world-famous public school. The school was founded in 1567 by Lawrence Sheriff, a grocer and a staunch supporter of Queen Elizabeth, by a gift of property in Manchester Square, London. After maintaining its position for some time as a good school for the Warwickshire gentry and a few others, specially under Dr. James and Dr. Wool, it became of national reputation under Dr. Arnold, who in raising his school, raised at the same time the dignity of his whole profession. Since his time the school has never lacked able teachers, remarkable for independence of mind. When Arnold died in 1842, Archbishop Tait succeeded him, having as coadjutors Lord Lingen, Dean Bradley, Principal Shairp, Thomas Evans, Theodore Walrond, Bishop Cotton. He in turn was succeeded by Dean Goulburn, who had as one of his assistants the future Archbishop Benson. The Crimean War reduced the numbers of the school to 300, and Dr. Goulburn resigned in 1857. He was succeeded by the future Bishop of London, Dr. Temple, who remained 12 years. He made a brilliant record, and added fame to Rugby's reputation. Having collected enough money to rebuild the chapel, to erect a gymnasium and to build new schools, Dr. Temple was succeeded by Dr. Hayman. To him succeeded Dr. Jex-Blake, who inaugurated a still greater building era. When he resigned in 1887 he left behind him a school unrivaled in its appointments. He was succeeded by Dr. Percival. Of illustrious Rugbeians may be named the poets Landor, Clough, and Matthew Arnold; Dean Stanley, who had the rare privilege of recording the work of his great headmaster in biography; Judge Hughes, who did the same equally felicitously in "Tom Brown's School Days"; Dean Vaughan, Lord Derby, Lord Cross, Mr. Goschen, Sir R. Temple, and York Powell the historians, Justice Bowen, Sir W. Palliser, Professor Sidgwick, C. Stuart-Wortley, Arthur Acland, and many others famous in British affairs. Pop. about 25,000.

RUGBY, a former town in Morgan co., Tenn.; about 114 miles N. of Chattanooga; on the Cumberland plateau; is in a rich mining and agricultural region. It owes its existence to a series of public lectures delivered in the United States by Thomas Hughes of England. It was settled by a company from England in 1880, who bought a large tract of land, and the settlement was made with impressive ceremonies. The town was laid out in building sites, farms, parks, etc.; several industries were introduced, but the scheme never realized the expectations of its projectors; and the place is now only classed as a health resort.

RUGE, ARNOLD, a German publicist; born in Bergen, Island of Rügen, Prussia, Sept. 13, 1802, or 1803. He embraced the doctrines of Hegel, and wrote philosophical criticisms in the Halle Year Book. He joined Karl Marx in Paris, and published with him the "German-French Year Books" (1843-1845). After the suppression of the paper which he started in Berlin, called "Reform," he went to London and formed, in connection with Ledru-Rollin and Mazzini, the European Democratic Committee. Among his works are: "Two Years in Paris" (1845); "Poetic Pictures" (1847); "Political Pictures" (1848); "Our System" (1850); "In Former Times" (1862-1867); and "Manifesto of the German People." He died in Brighton, England, Dec. 31, 1880.

RÜGEN (rü'gĕn), an island in the Baltic Sea, belonging to Prussia, near the coast of Pomerania; area, 377 square miles; exceedingly irregular in shape. The surface is fertile, undulating, and in many places covered with beautiful beech forests. The Stubbenkammer, a sheer chalk cliff (400 feet high) at the N. E. extremity, is frequently visited. The capital is Bergen. Many of the coast villages are popular sea-bathing resorts. From 1648 till 1815 Rügen belonged to Sweden. Pop. about 50,000.

RUGER, THOMAS HOWARD, an American military officer; born in Lima, N. Y., April 2, 1833; was graduated at the United States Military Academy in 1854; studied law and practiced in Janesville, Wis., in 1855-1861; became lieutenant-colonel of the 3d Wisconsin regiment in June, 1861; won distinction in numerous engagements during the Civil War; suppressed the draft riots in New York City in 1863; was brevetted Major-General of volunteers, Nov. 30, 1864; promoted colonel, U. S. A., in 1867; brigadier-

general in 1886; and major-general in 1895. He died June 3, 1907.

RUGOSA, in zoölogy, a group of *Madreporaria;* corallum sclerodermic with a true theca; generally both tubulæ and septa combined; septa generally some multiple of four, but with one or three prominent, or with a small channel; simple or compound corals represented in the modern seas only by two genera, one from the Mediterranean, the other from Florida. Families: *Stauridæ, Cyathaxonidæ, Cyathophyllidæ,* and *Cystiphyllidæ.* Also found in the Palæozoic rocks, the Upper Greensand, and the Tertiary. They were reef-builders.

RUHR (rör), a river of Prussia, that joins the Rhine at Ruhrort, about 15 miles N. of Düsseldorf. It rises in Westphalia, and has a tortuous course of about 200 miles, latterly through the Ruhr coal field region.

RUHR DISTRICT, the principal industrial and mining district of Germany, located in the Prussian province of Westfalen and Rhenish Prussia. It contains the Ruhr mountains, which yield vast quantities of a superior grade of coal. The coal industry, which has been highly developed, has resulted in the establishment of vast industrial enterprises, especially in connection with the metallurgical and textile industries. The most important towns are Dortmund, Hoerde, Witten, Bochum, Gelsenkirchen, Essen, Muelheim, Oberhausen, and Duisburg. Large quantities of coal, in normal times, are exported to Belgium, France, and Luxembourg, and through the Dortmund-Ems Canal to the North Sea ports. The district is one of the wealthiest of Central Europe.

In March, 1920, after the collapse of the Kapp *coup d'état,* uprisings of a serious nature occurred in the district. They were the result of the general strike which was declared by the Ebert government in order to suppress the reactionary movement started by Dr. Kapp and his adherents. However, after the collapse of this movement, the general strike, which was called off in the other parts of Germany, was continued in the Ruhr District and before long assumed dangerous proportions. Groups of armed workingmen led by radicals attempted to secure control of the industrial establishments. The uprising, however, was not all of a purely economic nature, but to a certain extent was influenced by internal and foreign politics. Eventually the Ebert government by the use of armed forces, succeeded in suppressing the revolt. The occupation of the Ruhr District was mentioned at various times since the signing of the Versailles Peace Treaty as a possibility in order to force Germany to give more prompt and strict adherence to the peace terms. The district was especially affected by the Peace Treaty and the negotiations following the latter, because of the fact that the majority of the coal which Germany was forced to deliver to France came from its mines.

RUIZ, JUAN (rö-ēth') a Spanish poet of the 14th century, known as "Archpriest of Hita"; born in Alcala or Guadalajara in 1300. He is the most original of mediæval Spanish poets, and has left a poem on love and women which is in reality a text-book for the man who wishes to become a successful lover. It is interspersed with songs, the best of which are the "Song of Scholars" and "Song of the Blind." He died about 1351.

RULES OF THE ROAD, the official designation of regulations adopted by national or international authorities for the management of vessels in storms, fogs, or other danger. Under act of the United States Congress, in 1896, the rules already established were considerably changed to comport with the schedule to be observed by vessels of all civilized nations on and after July 1, 1897. These rules apply also to inland waters, excepting the Great Lakes, for which a special set has been devised.

RUM, a spirit distilled chiefly in the West Indies from the fermented skimmings of the sugar-boilers and molasses, together with sufficient cane-juice to impart the necessary flavor. Its peculiar flavor is due to butyric ether. Caramel is added for coloring.

RUM, a mountainous island of Argyllshire, Scotland, belonging to the group of the Inner Hebrides, 15 miles N. by W. of Ardnamurchan Point. It is 8½ miles long, 8 miles broad, and 42 square miles in area, only 300 acres being arable, and the rest deer forest and moorland. The surface presents a mass of high sharp-peaked mountains, rising in Halival and Haskeval to the height of 2,368 and 2,659 feet. In 1826 the crofters, numbering fully 400, were, all but one family, cleared off to America, and Rum was converted into a single sheep farm; but in 1845 it was sold (as again in 1888) for a deer forest.

RUMANIA, a European kingdom. The total area in 1920 was 122,282 square miles, as against 53,489 square miles prior to the World War. The territory added following the war included Bessarabia, Bukovina, Transylvania, Crisana, Maramuresh, and a part of Banat. Old Rumania included the principalities of

Wallachia and Moldavia, and the province of Dobrudja on the Black Sea. The total population in 1920 was about 17,400,000. The capital is Bucharest, with a population of about 300,000. Other important cities are Jassy, Galatz, Braila, and Giurgevo.

Topography.—The surface is mainly occupied by undulating and well-watered plains of great fertility, gradually sloping upward to the Carpathians on the N. and W. borders, where the summits range from 2,650 to 8,800 feet above sea-level. The entire kingdom is in the basin of the Danube, which has a course of 595 miles in Rumania, forming the boundary with Bulgaria nearly the whole way. Its chief Rumanian tributaries are the Olta or Aluta, Ardjis, Jalomitza, Sereth, and Pruth (on N. W. border). The Danube forms a number of marshy lakes as it approaches the alluvial region of the Dobrudja, through which it discharges itself into the Black Sea by the St. George, Sulina, and Kilia channels. The climate is much more extreme than at the same latitude in other parts of Europe; the summer is hot and rainless, the winter sudden and very intense; there is almost no spring, but the autumn is long and pleasant. Rumania is an essentially agricultural and pastoral state, fully 70 per cent. of the inhabitants being directly engaged in husbandry. The chief cereal crops are maize, wheat, barley, rye, and oats; tobacco, hemp, and flax are also grown; and wine is produced on the hills at the foot of the Carpathians. Cattle, sheep, and horses are reared in large numbers. Excellent timber abounds on the Carpathians. Bears, wolves, wild boars, large and small game, and fish are plentiful. The country is rich in minerals of nearly every description, but salt, petroleum, and lignite are the chief minerals worked. Manufactures are still in a rudimentary state.

Production and Commerce.—Trade is fairly active, but is almost entirely in the hands of foreigners; the internal trade is chiefly carried on by Jews, whose numbers and prosperity are constant sources of anxiety to Rumanian statesmen, and who are in consequence subject to certain disabilities. The chief exports are grain (especially maize), cattle, timber, and fruit; the chief imports, manufactured goods, coal, etc. Before the World War Germany, Great Britain, and Austria-Hungary appropriated by far the greatest share of the foreign trade, the bulk of which passes through the Black Sea ports. The chief agricultural crops in 1919 were as follows: wheat 1,320,000 tons, rye 87,000 tons, barley 257,000 tons, oats 207,000 tons. The acreage under forests amounted to about 18,750,000. In the year 1915 the imports amounted to £13,185,821, and the exports to £22,581,469. The chief imports were metals and manufactures, vegetables, textiles and manufactures, wool, hair and manufactures, vegetable seed, etc. The principal exports were grain, petroleum, beans, oil, seeds, and foodstuffs. The output of petroleum has rapidly increased in recent years. In 1919 it reached over 44,000 tons. Other minerals worked to some extent are copper, iron manganese, and salt. Sugar is grown on an extensive scale and tobacco is produced in important quantities.

People.—The Rumanians, who call themselves Romani, claim to be descendants of Roman colonists introduced by Trajan; but the traces of Latin descent are in great part due to a later immigration, about the 12th century, from the Alpine districts. Their language and history both indicate that they are a mixed race with many constituents. Their language, however, must be classed as one of the Romance tongues, though it contains a large admixture of foreign elements. In Rumania there are about 4,700,000 Rumanians; 834,000 Jews and the remainder Gipsies, Bulgars, Magyars, Germans, Greeks and Armenians in the order named. Three-fourths of the population are peasants, who till 1864 were kept in virtual serfdom by the boiars or nobles. In that year upward of 400,000 peasant families were made proprietors of small holdings averaging 10 acres, at a price to be paid back to the State in 15 years. In 1918, 91,695,714 inhabitants belonged to the Greek Orthodox Church.

Education.—Education is compulsory and is improving from year to year, although there is still much to be desired. There were in 1918-19 5,764 elementary schools, with 11,088 teachers and 692,896 pupils. There are also a number of secondary schools, normal schools, and high schools. There are two universities at Bucharest, one at Jassy, and one at Kolozsvar, founded in 1919, and one in Cernauti, founded in 1920.

Transportation.—There are about 7,240 miles of railway, all of which are under the direction of the State. The railway system was partly disorganized as a result of the military campaigns, but has been extensively repaired. The merchant marine of Rumania in 1919 consisted of 158 vessels of 71,158 tons.

Army and Navy.—Military service is compulsory and universal from the ages of 21 to 46. In 1920 the approximate strength of the army was 250,000, organized in five army corps and seven army groups. The navy consists of a protective cruiser, a training ship, and a number of gunboats, coast guard vessels, etc.

Finances.—For the year 1916-1917 the

revenue and expenditure balanced at $124,624,000. The public debt on June 30, 1918, was about $1,025,000,000.

Government.—A constituent Assembly elected in May and June, 1920, unified the different constitutions of old Rumania, Bessarabia, Bukovina, and Transylvania. There is a legislature of two houses. The Senate consisted in 1920 of 170 members and the Chamber of Deputies of 347 members. All citizens of over 21 years of age paying taxes are electors. The executive is vested in a Council of Ministers.

History.—The country that is now Rumania was anciently part of Dacia, which was conquered by Trajan and made a Roman province in A. D. 106, a great many Roman colonists being then settled in it. In the 3d century it was overrun by the Goths, and subsequently by the Huns, Bulgars, Avars, and Slavs, all of whom have left more or less distinct traces on the land and people. At the beginning of the 9th century Rumania formed part of the great Bulgarian kingdom, after the fall of which in 1019 it nominally belonged to the Eastern Roman empire, though soon taken possession of by Turkish tribes. Wallachia and Moldavia were long divided. About 1241 Radu Negru, "Duke" of Fogeras, is said to have founded a voivodeship in Wallachia, which finally fell under Turkish supremacy after the battle of Mohacs in 1526. The boiars retained the nominal right of electing the voivodes till 1726; but thenceforward the Sultan openly sold the office to the highest bidders, who, without security of tenure, mercilessly plundered the unfortunate province so long as their power lasted. In Moldavia, Dragosh or Bogdan, about 1354, founded a kingdom, much as Radu had done in Wallachia, and it, too, fell under the overlordship of the Porte after the death of the voivode, Stephan the Great, in 1504. The Turks subsequently introduced the same custom of selling the hospodarship or voivodeship. In both provinces the government was most frequently purchased by Phanariotes, Greek inhabitants of the Phanar district of Constantinople. The successive wars between Russia and Turkey, the first of which began in 1768, were on the whole beneficial to Rumania, for the Russians gradually established a kind of protectorate over their fellow-Christians on the Danube. The treaty of Paris in 1856, after the Crimean War, confirmed the suzerainty of the Porte, but preserved the rights and privileges of the Danubian principalities, and added to them a part of Bessarabia. In 1858 the two provinces, each electing John Couza as its hospodar, were united by a personal union which in 1861 was formally converted into a real and national union. Couza, who assumed the title of Prince Alexander John I. in 1860, was forced by a revolution to abdicate the throne in 1866, and Prince Charles of Hohenzollern-Sigmaringen was elected to reign in his place. In the Russo-Turkish War of 1877-1878 Rumania sided with Russia and proclaimed its independence of Turkey. This claim was recognized by the treaty of Berlin in 1878, but Rumania was compelled to retrocede to Russia the part of Bessarabia which it acquired at the close of the Crimean War, and to receive the Dobrudja in exchange. In 1881 the principality declared itself a kingdom. When the Balkan War (*q. v.*) broke out in 1912, Rumania was at first neutral, but joined with Serbia and Greece in the second Balkan War against Bulgaria and as a result was awarded a part of the Dobrudja. King Charles died in 1914 and was succeeded to the throne by Crown Prince Ferdinand. Rumania was neutral in the World War until 1916 when she joined the Allies. At first success rewarded her arms, but owing largely to the failure of Russia to render promised help, her resistance crumbled under the swift invasion of powerful German armies. By the Peace Treaty of May, 1918, Bulgaria received that part of the Dobrudja awarded to Rumania in 1913, Germany obtained concessions in petroleum, salt, etc., and Austria obtained mountain-passes, and mineral rights. (By the Peace of Versailles in 1919, all these concessions forced from Rumania were abolished.) In 1918 Bessarabia, after being ravaged by the Bolsheviki, voted almost unanimously on April 9, 1918, for union with Rumania.

RUMELIA, EAST. See BULGARIA.

RUMEX, dock; a genus of *Polygoneæ;* sepals six, the three inner ones enlarging; petals none; stamens six, styles three, stigma multified; achene triquetrous, covered by the enlarged inner sepals, the latter often tuberculate. There are about 50 known species; generally distributed.

RUMFORD, BENJAMIN THOMPSON, COUNT, an American scientist; born in Woburn, Mass., March 26, 1753. Being a Tory in sympathy, he lived in London during the American Revolution. After serving England for a time, he entered the service of the Elector of Bavaria, rose to the position of Minister of War, and was finally created a count of the Holy Roman Empire. He took the title Rumford from the village of that name (now Concord, N. H.), where he had married. He spent the last years of his life at Auteuil, busily engaged in scientific researches—particularly on the nature and effects of heat, studies with

which his name is generally associated. His works include: "Essays: Political, Economical, and Philosophical" (1797-1806); and studies in domestic economy, particularly of cookery. He died in Auteuil near Paris, Aug. 21, 1814.

RUMINANTS, or **RUMINANTIA**, a group of herbivorous mammals, belonging to the great order of hoofed or ungulate Mammals, included in the Artiodactyle or "even-toed" section of these, and comprising the five families *Camelidæ* (camel and llama), *Tragulidæ* (chevrotain), *Cervidæ* (true deer), *Camelopardalidæ* (giraffe), and *Bovidæ* or *Cavicornia* (ox, sheep, goat, antelope). The faculty of rumination, though it gives name to this order, is not quite peculiar to it. Ruminants are distinguished from other orders by certain peculiarities of dentition. The most typical of the group, the ox, sheep, antelope, etc., have no incisor or canine teeth in the upper jaw, but have instead a hardened or callous pad against which the six lower incisors bite. In the lower jaw are two canines quite similar to the incisors, and the *Camelidæ* and *Tragulidæ* possess also upper canines. In both jaws are six grinding teeth on either side, separated by an interval from the front teeth. The feet of ruminants are cloven. Horns, developed in pairs, are present in the majority of the species; either solid, as in the antlers of the true deer, or hollow as in the horns of the ox, etc. The alimentary canal is very long. The stomach is divided into four compartments. In young ruminants, which feed on milk, the first three "stomachs" remain undeveloped till the animal begins to take vegetable food. Most of the ruminants are suitable for human food. They are generally gregarious, and are represented by indigenous species in all parts of the world except Australia.

RUMINATION, the act of chewing the cud. The food of the ruminants is grass, which requires a longer series of chemical changes to convert a portion of it into blood than does the flesh of other animals eaten by the Carnivora. To produce these changes there is a complex stomach divided into four parts, the rumen or paunch, the reticulum or honeycomb bag, the psalterium or manyplies, and the abomasum or reed. A ruminant does not chew the fodder which it eats, but simply swallows it. When it has had enough it retires to a quiet spot, forces up again to the mouth a portion of the food in its paunch, thoroughly chews it and then swallows it again. Another and another bolus is thus disposed of. Each of these, started from the paunch, is forced next into the honeycomb bag, where it receives its form, and then goes up the gullet. On returning it passes direct from the paunch into the manyplies or third stomach, and thence to the abomasum. Fluids may pass directly into any part of the stomach.

RUMP PARLIAMENT, in English history, the "rump" (tail end) of the Long Parliament after "Pride's Purge," Dec. 6, 1648. It was dissolved by Cromwell, April 20, 1653; restored, May 7, 1659; dissolved, Oct. 13; recalled, December, 1659, merged in the restored Long Parliament, Feb. 21, 1660. See PRIDE, THOMAS; LONG PARLIAMENT.

RUNCIMAN, RIGHT HON. WALTER, a British public official. He was born at South Shields, England, in 1870, and was educated at Trinity College, Cambridge. He became connected with several shipping organizations and from 1896 to 1905 was a managing director of the Moor Line of cargo steamships. In 1898 he contested Gravesend for a seat in the House of Commons, and in the following year was elected to represent Oldham as a liberal. In 1902 he was elected M. P. for Dewsbury, and represented that constituency till 1916. In 1905-7 he was Parliamentary Secretary to the Local Government Board; 1907-8, Financial Secretary to the Treasury; 1908-11, President of the Board of Education; 1914-16, President of the Board of Trade.

RUNCINATE, in botany (of a leaf): hook-backed; curved in a direction from the apex to the base, having the points of the great central lobes reflexed, as the leaves of *Taraxacum officinale*.

RUNES. In the Scandinavian lands, Sweden, Denmark, and Norway, thousands of inscriptions have been found written in the ancient alphabet of the heathen Northmen. Similar records are scattered sparsely and sporadically over the regions which were overrun or settled by the Baltic tribes between the 2d century and the 10th. A few are found in Kent, England, which was conquered by the Jutes, others in Cumberland, Dumfriesshire, Orkney, and the Isle of Man, which were occupied by the Norwegians, and in Yorkshire, which was settled by the Angles. One or two have been found in the valley of the Danube, which was the earliest halting-place of the Goths in their migration S.; and there is reason to believe that a similar alphabet was used by the Visigoths and Burgundians in Spain and France, while it is noteworthy that there is no trace of this writing having been used in Germany or by the Saxons and Franks.

There are several interesting runic inscriptions in England, among which may be mentioned that on the Ruthwell cross in Dumfriesshire, and that on the Bew-

castle cross in Cumberland. Several crosses in the Isle of Man are carved with the old Irish interlaced ornaments, and are in the form of the old Irish cross. See ALPHABET.

RUNJEET SINGH, called the "LION OF THE PUNJAB," founder of the Sikh kingdom; born in Gugaranwalla, India, Nov. 2, 1780. His father, a Sikh chieftain, died in 1792, and the government fell into the hands of his mother. At the age of 17, however, Runjeet rebelled against his mother's authority, assumed the reins himself, and began a career of ambition. The Shah of Afghanistan granted him possession of Lahore, which had been taken from the Sikhs, and Runjeet soon subdued the small Sikh states to the N. of the Sutlej. The chiefs to the S. of that river invoked the protection of the British, who made an arrangement with Runjeet in 1809, both accepting the Sutlej as the S. boundary of his dominions. He now organized his army after the European model with the help of French and English officers, and steadily extended his power, assuming the title of rajah in 1812. In 1813 he took Attock, and in the same year assisted Shah Shuja, then a refugee from Afghanistan, in return for the famous Koh-i-noor diamond. In 1818 he captured Mûltan; in 1819 he annexed Kashmir, and in 1823 the Peshawur valley. He was now ruler of the entire Punjab, and in 1819 had already assumed the title of Maharajah, or king of kings. In 1836 he suffered a heavy defeat from the Afghans, but until his death he retained his power over his 20,000,000 subjects. He died in Lahore, June 27, 1839.

RUNNIMEDE, a long stretch of green meadow, lying along the right bank of the Thames, 1 mile above Staines and 36 miles by river W. S. W. of London. Here, or on Charta Island, a little way off the shore MAGNA CHARTA (*q. v.*) was signed by King John, June 15, 1215. In the document the king states that it was signed "by our hands in the meadow which is called Runnimede."

RUPEE, a silver coin in use in the British dominions in India, with corresponding ones of much inferior workmanship and variable value in the native states. Also a silver coin of India, worth normally, in United States money, 32.4c.

RUPERT OF BAVARIA, PRINCE, an English military officer; born in Prague, Bohemia, Dec. 17, 1619. He was the third son of Frederick V., elector palatine and King of Bohemia, by Elizabeth, daughter of James I. of England. After some military experience on the Continent he went to England to assist his uncle, Charles I., and in 1642 was made general of the horse. He distinguished himself at Edgehill and Chalgrove, captured Birmingham and Lichfield in 1642, and Bristol in 1643, and displayed his courage at Marston Moor and Naseby in 1645. His feeble defense of Bristol against Fairfax involved him in temporary disgrace with Charles; but in 1648 he was made admiral of the English royalist fleet. He carried on a predatory naval war against Parliament, in European waters, till Blake forced him to escape to the West Indies, where he preyed on English and Spanish merchantmen. In 1653 he joined Charles II. at Versailles. After the Restoration he was appointed lord-high-admiral and served with Monk against the Dutch. He became governor of Windsor Castle, privy-councilor, etc. Many of his later years were devoted to scientific study. He introduced mezzotint engraving into England. As one of the founders and the first governor of the Hudson Bay Company his name was given to RUPERTSLAND (*q. v.*). He died in London, Nov. 29, 1682, and was buried in Westminster Abbey.

RUPERTSLAND, an extensive but indeterminate region in the interior of Canada, named in honor of Prince Rupert, and transferred to the Hudson Bay Company, of which that prince was one of the founders, by Charles II. in 1670. This region is now included in the Northwest Territories.

RUPTURE, the breaking or laceration of the walls or continuity of an organ, especially of a viscus. Also, the popular name for HERNIA (*q. v.*).

RURAL CREDIT, various systems of extending loans to farmers for the purpose of financing the growing and marketing of their crops. Rural credit may be divided into two chief forms: co-operative and state aid. The former is by far the most extensively practiced. The co-operative method had its origin in Germany, where it was first established by Raiffeisen, from whom it has taken its name as the Raiffeisen system. A number of farmers in a community join together and form a co-operative bank in which the members are jointly liable for the debts of the association. Each member owns a limited number of shares, usually only one. Each member has only one vote in determining the policies of the association. In Germany, before the World War, the share capital of the banks formed only three and eight-tenths per cent. of the total capital available for loans, eighty-five per cent. of the capital being supplied by the savings accounts of the farmer-members. This system has

spread all over agricultural Europe, but has made little or no headway in this country. In the United States the farmer usually obtains his credit through the regular commercial banks, through credit at the general store, or by means of crop liens, all of which have been extremely unsatisfactory. Within recent years credit unions have been established, especially in Massachusetts, where they have been encouraged by special legislation. The progress of co-operative credit unions has been so slow in this country, however, that the need of some system of state aid has long been felt, and finally took concrete shape in the Federal Farm Loan Act, passed in July, 1916, with the specific purpose of aiding the farmers to produce for the war needs of the nation during a critical period. See "Co-operation in Agriculture," by G. Harold Powell, and "Co-operation Among Farmers," by John Lee Coulter.

RURIK, the founder of the Russian monarchy; flourished in the 9th century; he is generally considered to have been a Varangian of Scandinavian origin, and to have led a successful invasion against the Slavs of Novgorod about 862. He was assisted by his brothers, to whose territories he afterward succeeded. He died in 879, and his family reigned in Russia till the death, in 1598, of Feodor, son of Ivan the Terrible, when it was succeeded by the house of Romanoff. Many Russian families still claim a direct descent from Rurik.

RUSA, a genus of *Cervidæ*, or a subgenus of Cervus, with several species, from the East Indies. They are generally of large size, and have round antlers, with a snag projecting in front just above the base of each. There are several species, of which the best known is *R. aristotelis*, the sambur.

RUSH (*Juncas*), a genus of plants of the natural order *Junceæ*, having a glume-like (not colored) perianth, smooth filaments, and a many-seeded, generally three-celled capsule. The species are numerous, mostly natives of wet or marshy places in the colder parts of the world; some are found in tropical regions. The name rush perhaps properly belongs to those species which have no proper leaves; the round stems of which, bearing or not bearing small lateral heads of flowers, are popularly known as rushes. The soft rush (*J. effusus*) is a native of Japan as well as of Great Britain, and is cultivated in Japan for making mats. The common rush (*J. conglomeratus*) and the soft rush are largely used for the bottoms of chairs and for mats, and in ruder times, when carpets were little known, they were much used for floor covering. The stems of the true rushes contain a large pith or soft central substance, which is sometimes used for wicks to small candles called rushlights. There are 20 or 22 British species of rush. They are often very troublesome weeds to the farmer. Thorough drainage is the best means of getting rid of them. Many marshy and boggy places abound in some of the species having leafy stems and the leaves jointed internally, popularly called sprots or sprits, as *J. acutiflorus*, *J. lamprocarpus*, and *J. obtusiflorus*. They afford very little nourishment to cattle; but are useful for making coarse ropes for ricks.

The stage was also strewed with rushes in Shakespeare's time, as well as the churches with rushes or straw according to the season of the year, and anciently rushes were scattered in the way where processions were to pass. To order fresh rushes was a sincere mark of honor to a guest. The strewing of the churches grew into a religious festival conducted with much pomp and circumstance. This ceremonious rush-bearing lingered long in the northern counties of England, and has been occasionally revived in modern times, as at Grasmere in 1884, etc.

RUSH, BENJAMIN, an American physician; born in Philadelphia, Dec. 24, 1745; he was graduated at Princeton in 1760; studied medicine in Philadelphia, Edinburgh, London, and Paris; and in 1769 was made Professor of Chemistry in the Philadelphia Medical College. Elected a member of the Continental Congress, he signed the Declaration of Independence (1776). In April, 1777, he was appointed surgeon-general, and in July physician-general, of the Continental army. His duties did not prevent him from writing a series of letters against the articles of confederation of 1776. In 1778 he resigned his post in the army because he could not prevent frauds on soldiers in the hospital stores, and returned to his professorship. He was a founder of the Philadelphia dispensary, the first in the United States, and of the College of Physicians, was active in the establishment of public schools, was a member of the state conventions which ratified the Federal Constitution and formed the State constitution. He next became Professor of the Theory and Practice of Medicine at Philadelphia, to which chair he added those of the Institutes and Practice of Medicine and Clinical Practice (1791); and of the Practice of Physic (1797); and during the epidemic of 1793 he was as successful as devoted in the treatment of yellow fever. In 1799 Rush was appointed treasurer of the United States Mint, which post he

held till his death. He was called "the Sydenham of America" and his medical works brought him honors from several European sovereigns. He wrote "Medical Inquiries and Observations" (5 vols., 1789-1793); "Essays" (1798), and "Diseases of the Mind" (1812). He died in Philadelphia, April 19, 1813.

RUSH, RICHARD, an American statesman; born in Philadelphia, Pa., Aug. 29, 1780; son of the preceding. He was graduated at Princeton College in 1797; studied law in Philadelphia; was appointed attorney-general of Pennsylvania in 1811, and was attorney-general of the United States from 1814 to 1817. In 1817 he was temporary Secretary of State under President Monroe, and was by him appointed minister to England, from whence he was recalled in 1825 by President Adams, who made him Secretary of the Treasury. In 1828 he was candidate for the vice-presidency on the same ticket with President Adams, who was nominated for re-election, and received the same number of electoral votes. In 1836 President Jackson appointed him commissioner to obtain the Smithsonian legacy, then in the English Court of Chancery, in which he was successful, and returned in 1838 with the entire amount, $515,169. In 1847 he was appointed minister to France. At the close of President Polk's term he asked to be recalled and spent the rest of his life in retirement. He died in Philadelphia, Pa., July 30, 1859. He left "Memoranda of a Residence at the Court of St. James," two volumes (1833-1845); "Washington in Domestic Life" (1857); "Occasional Productions, Political, Diplomatic" (1860); etc.

RUSHVILLE, a city of Indiana, the county-seat of Rush co. It is on the Cincinnati, Hamilton, and Dayton, the Cleveland, Cincinnati, Chicago, and St. Louis, the Fort Wayne, Cincinnati, and Louisville, and the Pittsburgh, Cincinnati, Chicago, and St. Louis railroads. It has important industries, which include the manufacture of furniture, woodworking machinery, carriages, lumber, etc. It has also an important trade in grain, cattle, sheep, and hogs. Pop. (1910) 4,925; (1920) 5,498.

RUSK, JEREMIAH M'LAIN, an American agriculturist; born in Morgan co., Ohio, June 17, 1830; removed to Wisconsin in 1853 and became a farmer. He entered the Union service during the Civil War, as major of a regiment he had raised, the 25th Wisconsin Volunteers; was promoted to lieutenant-colonel in 1863; was brevetted colonel and brigadier-general, 1865. From 1866 to 1870 he was bank-controller of Wisconsin, and represented his State from 1871 to 1877 in Congress. In 1882 he was elected governor of Wisconsin and served in that capacity till 1889. He was made secretary of the newly-created Department of Agriculture in 1889, and held this office till 1893. He died in Viroqua, Wis., Nov. 21, 1893.

RUSKIN, JOHN, an English author; born in London, Feb. 8, 1819. He studied at Christ Church, Oxford; gained the Newdigate prize in 1839, and graduated in 1842. In 1867 he was appointed Rede lecturer at Cambridge, and in 1870-1872, 1876-1878, 1883-1885, he was Slade Professor of Fine Arts at Oxford, where in 1871 he gave $25,000 for the endowment of a university teacher of drawing. In "Modern Painters" he advocated a complete revolution in the received conventions of art and art criticism. Ruskin was the first art critic to place criticism upon a scientific basis. In 1851 he appeared as a defender of pre-Raphaelitism. About 1860 he began to write as a political economist and social reformer; his chief works in this sphere being "Unto this Last" (1862); "Munera Pulveris" (1872); and "Fors Clavigera" (1871-1884), a periodical series of letters to the working men and laborers of Great Britain. In this connection he founded in 1871, "The Guild of St. George"; founded a linen industry at Keswick, and revived, in Langdale, hand-loom weaving. His chief works, apart from pamphlets and contributions to periodicals, are: "Modern Painters" (1843-1860); "Seven Lamps of Architecture"; "Poems" (1850); "King of the Golden River" (1851), a fairy legend; "The Stones of Venice" (1851-1853); "Giotto and his Works at Padua" (1854); "Lectures on Architecture and Painting" (1854); "Notes on the Royal Academy" (1855-1859 and 1875); the letterpress accompanying "Turner's Harbors of England" (1856); "Notes on the Turner Gallery at Marlborough House" (1857); "Catalogue of Turner's Sketches at the National Gallery" (1857); "Elements of Drawing" (1857); "Political Economy of Art" (1857), better known as "A Joy Forever"; "Sesame and Lilies" (1865); "Ethics of the Dust" (1866); "Crown of Wild Olive" (1866); "Lectures on Art" (1870); "Aratra Pentelici" (1872); "Love's Meinie" (1873); "Val d'Arno" (1874); "Proserpina" (1875); "Deucalion" (1875); "Mornings in Florence" (1875); "Frondes Agrestes" (1875-1876); "Elements of English Prosody" (1880); "Fiction, Fair and Foul, in the 19th Century" (1880-1881); "Our Fathers Have Told Us" (1881); "Lectures on the Art of England" (1883); "On the Pleasures

of England" (1884); "Hortus Inclusus" (1887), a selection of letters; and "Præterita," an autobiography (1885-1889). After 1885 he lived at Brantwood, on Coniston Lake, where he died Jan. 20, 1900.

RUSSELL, ANNIE, an American actress, born in Liverpool, England, 1869. She made her first appearance at the age of 7 in Montreal. Somewhat later she was a member of a juvenile "Pinafore" company in New York. After touring in South America, she returned to the United States, and became a member of the Madison Square Theatre Company. Her first great success was scored as "Esmeralda." Beginning with 1895 she appeared in many stellar rôles in "Mice and Men," "Major Barbara," etc. She was also very successful in the interpretation of Shakespearian characters, such as "Puck" in "Midsummer Night's Dream," etc., as well as in a number of other classical plays, including Sheridan's "Rivals" and "School for Scandal" and Goldsmith's "She Stoops to Conquer." At various times she also appeared with considerable success in London.

RUSSELL, BERTRAND ARTHUR WILLIAM, a British author. He was born at Trelleck in 1872 and was educated at Trinity College, Cambridge. Later he became Lecturer and Fellow of the same college. He has written and traveled much, and articles written by him on Sovietism after a visit to Russia in 1920 attracted attention. His works include: "German Social Democracy," "Essay on the Foundations of Geometry," "Philosophy of Leibnitz," "Principles of Mathematics," "Philosophical Essays," "Problems of Philosophy," "Principia Mathematica," "Principles of Social Reconstruction," "Mysticism and Logic," "Roads to Freedom."

RUSSELL, CHARLES EDWARD, an American journalist and author, born at Davenport, Iowa, in 1860. He was educated at St. Johnsbury Academy, and for several years was engaged in newspaper work. He was a student of Socialism and one of the most prominent Socialists in the United States up to the entrance of the United States in the World War, when he withdrew from the regular Socialist Party organization. He was Socialist candidate for governor of New York in 1910 and 1912. In 1917 he was a member of the diplomatic mission sent to Russia by the United States and in 1919 was a member of the President's Industrial Commission. His writings include "Business, the Heart of the Nation" (1911); "Unchained Russia" (1918); "After the Whirlwind" (1919); "Bolshevism and the United States" (1919).

RUSSELL, COUNTESS, a British writer. She was born in England, the daughter of H. Herron Beauchamp, and married 1st, Count Henning August Arnim (d. 1910), and 2nd, in 1916, Earl Russell. Her works include: "Elizabeth and Her German Garden," "The Solitary Summer," "The April Baby's Book of Tunes," "The Benefactress," "The Adventures of Elizabeth in Ruegen," "The Princess Priscilla's Fortnight," "Fräulein Schmidt and Mr. Anstruther," "The Caravaners," "Priscilla Runs Away," "The Pastor's Wife," "Christopher and Columbus."

RUSSELL, GEORGE W., an Irish poet and writer, born in 1867. His chief literary work was done under the initials "AE." For a time he studied art, but abandoned this to devote himself to the Celtic movement and the economic improvement of Ireland. Some of his poetry is of great beauty. He was one of the chief figures in the Irish literary revival. His published works include "Homeward: Songs by the Way" (1894); "The Earth Breath and Other Poems" (1897); "The Spirit of England" (1915); and "Collected Poems" (1915). He also wrote several dramas in prose. The most notable of these was "Deirdre," which was performed by the Irish National Theater Society.

RUSSELL, GEORGE WILLIAM ERSKINE, an English public official and writer, born in London in 1853. He was educated at Harrow and at University College, Oxford. He was elected to the House of Commons as a Liberal from Aylesbury, from 1880 to 1885, and from North Bedfordshire from 1892 to 1895. From 1892 to 1894 he was Under-Secretary of State for India and was Under-Secretary of the Home Department in 1894-1895. He wrote "A Life of Gladstone" (1891); two series of memoirs entitled "Collections and Recollections" (1898); "Sydney Smith" (1905); and "The Spirit of England" (1915).

RUSSELL, HOWARD HYDE, an American clergyman and publisher, born at Stillwater, Minn., in 1855. He studied at Griswold College and graduated from the law department of Indianola College, in 1878, practicing law for 5 years. He served as superintendent of schools in Adams co., Iowa. In 1885 he was ordained to the Congregational ministry and was pastor of missions and churches in Kansas City and Chicago. In 1893 he founded the Anti-Saloon League in Ohio and was its superintendent for the four years following. He was also one

of the organizers and the first superintendent of the National Anti-Saloon League in America. He was chairman of the executive committee of the League from 1903 to 1909, and served also in various executive capacities in that organization. He founded the Lincoln-Lee Legion and was a founder and the first American president of the World League Against Alcoholism. He wrote "A Lawyer's Examination of the Bible" (1893), and many pamphlets and articles against liquor traffic.

RUSSELL, ISAAC FRANKLIN, an American jurist and educator, born at Hamden, Conn., in 1857. He graduated from the New York University in 1875, and from 1881 was professor of political science at that university. He served as chief justice of the Court of Special Sessions in New York, from 1910 to 1916. He contributed many articles on law to law journals and to encyclopædias.

RUSSELL, JOHN, EARL RUSSELL, K.G., an English statesman, third son of the 6th Duke of Bedford; born in London, August 18, 1792. Educated at Edinburgh University, he entered Parliament in 1813 before attaining his majority. In 1819 he made his first motion in favor of parliamentary reform, of which through life he was the champion. Though temporarily unseated in 1826, owing to his advocacy of Catholic Emancipation, he carried a motion in 1828 against the Test Acts and thus led to their repeal. In 1831 he was paymaster-general in Lord Grey's administration, and introduced the first Reform Bill to the House of Commons. He was home secretary from 1835-1839, when he became colonial secretary. From 1841 till 1845 he led the opposition against Peel, with whom, however, he was in sympathy on the Corn Law question; and when Peel resigned in 1846 Russell formed a ministry and retained power till February, 1852. He re-entered office in December, 1852, as foreign secretary under Lord Aberdeen, and in 1855 became colonial secretary in Lord Palmerston's cabinet. He represented Great Britain at the Vienna conference, but resigned office in July of the same year. In 1859 he became foreign secretary, the Trent affair with the United States occurring while he was in office. In 1861 he was raised to the peerage, and in 1865 succeeded Lord Palmerston in the leadership of the Liberal party; but when his new reform bill was rejected in 1866 he went out of office. He was the author of numerous books and pamphlets, including lives of Thomas Moore, Lord William Russell, and Charles Fox, and "Recollections and Suggestions" (1813-1873), published in 1875. He died in 1878.

RUSSELL, LILLIAN (MRS. ALEXANDER P. MOORE), an American actress, born in Clinton, Iowa, in 1861. She studied vocal and violin music in Chicago, and grand opera under Leopold Damrosch. Her first appearance on the stage was made in 1879 as a member of the chorus of a "Pinafore" company. Somewhat later she appeared as a ballad singer at Pastor's Theater, New York, at which time she first used the stage name of "Lillian Russell," her real name being Leonard. Until 1899 she sang at the Casino Theater, New York. For several seasons she was one of the most successful members of Weber & Field's Stock Company, joining later, as prima donna, the McCaull Opera Company, and organized, still later, her own company with which she appeared with great success both in England and the United States. She has also made frequent appearances on the vaudeville stage, where her lecture, "How to Live a Hundred Years," became well known. During the World War she took an active interest in Red Cross and Liberty Loan campaigns.

RUSSELL OF KILLOWEN, CHAS., BARON, a British jurist, born at Newry, Ireland, in 1832. He was educated at Trinity College, Dublin, and was admitted to the bar in 1859. He gained prominence as an advocate and was appointed Attorney-General in the Gladstone cabinet in 1886, and held that office again from 1892 to 1894. In 1893 he was counsel for the British claims before the Bering Sea Commission. In the following year he was appointed Lord of Appeal in Ordinary and was made a life peer. In the same year he became Chief Justice. He served as a member of the Venezuelan Boundary Arbitration Tribunal in 1899. He died in 1900.

RUSSELL, WILLIAM, LORD RUSSELL, an English statesman, third son of the 5th Earl of Bedford; born Sept. 29, 1639. He entered Parliament immediately after the Restoration, and in 1669 married Rachel, Lady Vaughan, afterward known for her "Letters." He was a prominent leader of the Whigs, animated by a bitter distrust of the Roman Catholics and a strong love of political liberty. In 1679 he was a member of the new privy council appointed by Charles II. to ingratiate himself with the Whigs. Resigning in 1680, he became conspicuous in the efforts to exclude the king's brother, the Roman

ARCTIC OCEAN
NORTH ATLANTIC OCEAN
BARENTS SEA
KARA SEA
WHITE SEA
BALTIC SEA
GULF OF BOTHNIA
GULF OF FINLAND
Gulf of Ob
Gulf of Riga
Lake Ladoga
Lake Onega
Helsingfors
Kronstadt
PETROGRAD
STOCKHOLM
Riga
Archangel
Kanin Noss
Waigatz I.
Kolguev I.
Novaya Zemlya
Yalmal Peninsula
Kola Peninsula
Lofoden Islands
Arctic Circle
Siberia
Ural Mts.
Perm
Vyatka
Kostroma
Yaroslav
Tver
Pskov
Vologda
Olonetz
Petrozavodsk
Kem
Onega
Mezen
Pechora
Kolguev
Waigatz Str.
Kara Bay
Gulf of Ob

RUSSIA
SCALE OF STATUTE MILES
0 50 100 150 200 250
SCALE OF KILOMETERS
0 100 200 300 400
Important towns are shown in heavy face type.
Railways shown thus
PETROGRAD AND VICINITY
SCALE OF MILES
0 2 4 6
Kronstadt
PETROGRAD
Moscow
Kazan
Saratov
Astrakhan
Tiflis
Bak
Trebizond
Sinope
Samsun
Odessa
Sevastopol
Kharkov
Ekaterinoslav
Rostov
Yeisk
Taganrog
Simferopol
Kherson
Nikolayev
Voronezh
Kursk
Orel
Tula
Kaluga
Smolensk
Minsk
Brest Litovsk
Lemberg
Warsaw
Lodz
Radom
Cracow
Bucharest
Constanza
Danube
Dniester
Dnieper
Don
Volga
Ural
Caspian Sea
Black Sea
Sea of Azof
Aral Sea
Kuban District
Maikop
Vladikavkas
Petrovsk
Derbend
Baku
Batoum
Kutais
Erzeroum
Sivas
Ersingian
Euphrates
Mt. Ararat
Lenkoran
Nakichevan
Michailovsk
Astrakhan
Mouths of the Volga
Mertvyi Kultuk or Dead Bay
Embar Bay
Kosa Uteh
Sulak R.
65 Feet below Sea Level
Inner or Bukeyev Kirghiz Horde
(To Orenburg)
Orenburg Kirghiz Little Horde
Cossacks of the Ural
Ural R.
Kalmykovskaia
Sakarnaia
Gurjev
Nikolskoie
Krasnoi-yar
Ratkalinskaia
Alabugskaia
Kulali I.
Alexandrovsk
Petrovskoie
Tchaikar L.
Badarinskaia
Iletskaia Saschita
Syrt Rospuska Orenburg
Samara
Simbirsk
Kazan
Tchelnoki
Bugulma
Bugurusslan
Sergievsk
Stavropol
Kinel
Syzran
Kuibyshev
Volsk
Kamyshin
Tsaritzyn
Balashov
Pavlovsk
Voronezh
Borisoglebsk
Kozlov
Tambov
Morshansk
Penza
Insar
Narovchat
Serdobsk
Biela Kliutch
Oserki
Ekaterinenstadt
Balanda
Urbach
Kamyshin
Nikolaevsk
Kvalynsk
Yerschov
Petrovskoie
Balykley
Dubovka
Zaritzyn
Tchernyi Yar
Baskunchak
Ilinka
Iskra
Bolshoi Bereznikovski
Kalinovski
Kamyshinka

Catholic Duke of York, from the succession to the throne, but retired from public life when the Exclusion Bill was rejected. When the Rye House Plot was discovered in 1683, Russell was arrested on a charge of high treason, and though nothing was proved against him the law was stretched to secure his conviction. He was sentenced to death, and was beheaded in London, July 21, 1683. An act was passed in 1689 reversing his attainder.

RUSSELL, WILLIAM CLARK, an English novelist; born (of English parentage) in New York City, Feb. 24, 1844. He spent much of his early life at sea, and afterward settled at Ramsgate, England. He published a great number of sea stories and novels, among which are: "The Wreck of the Grosvenor" (1878); "A Sailor's Sweetheart" (1880); "My Watch Below" (1883); "A Sea Queen" (1883); "The Frozen Pirate" (1887); "Marooned" (1889); "The Romance of Jenny Harlowe" (1889); and "The Good Ship Mohock" (1895); "List Ye Landsmen," "The Two Captains," and "Nelson" (1897); "The Romance of a Midshipman" (1898); "The Ship's Adventure" (1899); "His Island Princess" (1905). He died in 1911.

RUSSELL, WILLIAM EUSTIS, an American lawyer; born in Cambridge, Mass., Jan. 6, 1857; was graduated at Harvard University in 1877, and was admitted to the bar in 1880; was mayor of his native city in 1885-1887, and governor of Massachusetts in 1890–1892. He then resumed the practice of law, and became a member of the Board of Indian Commissioners in November, 1894. He was found dead in his fishing tent at Little Pabos, Quebec, Canada, on the morning of July 16, 1896.

RUSSELL, SIR WILLIAM HOWARD, an English journalist; born in Lilyvale near Dublin, March 28, 1820. He was special correspondent of the London "Times" in the Danish War in Schleswig-Holstein (1850); in the Crimea (1854–1855); in India during the Sepoy Mutiny (1857–1859); in the Italian campaign (1859); in the United States during the Civil War, and known as "Bull Run Russell" and its war correspondent in the Austro-Prussian War (1866); in the Franco-German War of 1870; in the war in South Africa (1879-1880); in the Egyptian War (1883-1885). He published: "Extraordinary Men" (1853); "The Crimean War" (1855-1856); "My Diary in India"; "My Diary During the Last Great War" (1873); "The Prince of Wales's Tour" (1877); "Hesperothen" (1882); and others. He received various honors from foreign governments and was knighted in 1895 in recognition of his achievements. He died Feb. 11, 1907.

RUSSELL SAGE FOUNDATION, an organization incorporated in 1907 for the improvement of social and living conditions in the United States. The institution was established by Mrs. Russell Sage, with an endowment of $10,000,000. Its work is chiefly devoted to research and publication. There are a Division of Statistics and Education, a Department of Recreation, a Division of Industrial Studies, a Division of Remedial Loans, a Department of Surveys and Exhibits, a Charity Organization Department, and a Department of Child Helping. Besides extensive research work in these various departments, the results of which were embodied in many publications, the Foundation also supervised the development of a modern suburban community at Forest Hills Gardens, Long Island, N. Y. During the war, practically the entire staff and resources of the Foundation were put at the disposal of the government and the various welfare organizations engaged in work for soldiers and their dependents. The headquarters of the Foundation are at 130 East Twenty-second street, New York City. In 1920, R. W. de Forest was president, and John M. Glenn, secretary and general director.

RUSSIA—THE RUSSIAN FEDERATIVE REPUBLIC, formerly one of the most powerful empires of the world. second only in extent to the British empire. It comprehended most of eastern Europe and all northern Asia, and was bounded N. by the Arctic Ocean; W. by Sweden, the Gulf of Bothnia and the Baltic, Prussia, Austria, and Rumania; S. by the Black Sea, Turkey in Asia, Persia, Afghanistan, the Chinese empire; E. by the Pacific and Bering Strait. The total area was 8,647,657 square miles, and the population in excess of 180,000,000.

The largest towns were St. Petersburg (Petrograd), Moscow, Warsaw, Odessa, Lodz, Riga, Kieff, Kharkoff and Tiflis.

European Russia included the Sea of Azof, the Vistula provinces (former Poland), and Finland; Russia proper was subdivided into 50 provinces; Archangel, Astrakhan, Bessarabia, Courland, Don Cossacks, Ekaterinoslaf, Esthonia, Grodno, Kaluga, Kazan, Kharkoff, Kherson, Kieff, Kostroma, Kovno, Kursk, Livonia, Minsk, Mohilev, Moscow, Nijni-Novgorod, Novgorod, Olonetz, Orel, Orenburg, Penza, Perm, Podolia, Poltava, Pskof, Riazan, S. Petersburg, Samara, Saratoff, Simbirsk, Smolensk, Tambof, Taurida,

Tchernigoff, Tula, Tver, Ufa, Vilna, Vitebsk, Viatka, Vladimir, Volhynia, Vologda, Voronezh, Yaroslavl. Poland formed 10 provinces: Kalisz, Kielce, Lomza, Lublin, Piotrkov, Plock, Radom, Siedlce, Suwalki, and Warsaw. Finland, eight provinces: Abo-Bjorneborg, Kuopio, Nyland, St. Michel, Tavastehus, Uleaborg, Vasa, and Viborg. There were also certain popular divisions of Russia, as Great Russia (in the center), Little Russia (in the S. W.), White Russia (in the N. W.). Asiatic Russia was divided into: Northern Caucasia, Transcaucasia, Transcaspia, Kirghiz Steppes, Turkestan, Western Siberia, Eastern Siberia, Amur and Maritime provinces. St. Petersburg and Moscow were the capitals of the empire.

In 1920 the greater part of the former Russian empire, including Siberia, was under the rule of the Bolsheviks. A number of states, however, had evolved and were maintaining themselves on the borders of the old empire. Two of these, Finland and Poland, had been formally recognized and were well established as independent governments. Six others, Armenia, Azerbaijan, Esthonia, Georgia, Latvia, and Lithuania had received some degree of recognition from the allied countries, while the Ukraine had been recognized by Poland. As to the condition of Daghestan, Kuban and Terek, little definite was known, although in each of these provinces an independent republic had been set up.

General Description.—European Russia consists almost wholly of immense plains, the Valdai Hills, between St. Petersburg and Moscow, averaging 500 feet and never exceeding 1,200 feet above sea-level, forming the only elevated region of the interior and an important watershed. The mountains of Taurida, lining the S. shores of the Crimea, have a height of about 4,000 feet; the Caucasus, running from the Black Sea to the Caspian, reach the height of 18,500 feet; the Urals, stretching from the Caspian to the Arctic Ocean and separating European from Asiatic Russia, have their greatest height below 7,000 feet. Beyond the Urals are the vast Siberian plains. Russia is watered by numerous rivers, some running a course of thousands of miles. The Petchora, the Mezene, Northern Dwina, and Onega are the principal rivers of European Russia which send their waters to the Arctic Ocean; the Neva, Volkhoff, Svir, Narova, Velikaya, Duna, Niemen, and Vistula belong to the Baltic basin; the Black Sea basin comprises the Pruth, Dniester, Dnieper, and the Don; while the Caspian receives besides other rivers the Volga, the largest of all Russian rivers. Altogether Russia and Poland have 49,000 miles of navigable rivers. Asiatic Russia has also a number of very large rivers, as the Obi, Yenisei, and Lena in Siberia, and the Amur toward the Chinese frontier. This complete river system is of incalculable value to Russia, as by its means internal communication is carried on. Canals connect the navigable rivers, so as to form continuous waterways; there being 500 miles of canals and 717 of canalized rivers. River steam navigation has been much developed of recent years. The lakes are also on a gigantic scale. Lake Ladoga, near Petrograd, is the largest in Europe. Other large lakes in Europe are those of Onega, Peipus, and Ilmen. In Asia there is the Sea of Aral larger than any of those mentioned, followed by Baikal, Balkash, and others. The Caspian Sea now also forms almost a Russian lake. From the extent of the plains and steppes, the swamps, moors, desert wastes, and forests of Russia, the scenery as a whole is very monotonous.

Climate and Soil.—As may be expected from its vastness this empire offers soils and climates of almost every variety. Extreme cold in winter and extreme heat in summer are, however, a general characteristic of Russian climates. As regards soil, large sections of Russia are sandy, barren wastes and vast morasses. The most productive portion is that between the Baltic and the Gulf of Finland, and the Volga, on the N. and E.; Prussia, Austria, etc., on the W.; and the Black Sea on the S. It has, generally speaking, a soft black mold of great depth, mostly on a sandy bottom, easily wrought, and very fertile. The more southern portion of Siberia, as far E. as the river Lena, has, for the most part, a fertile soil, and produces, notwithstanding the severity of the climate, nearly all kinds of grain.

Vegetable Products, Agriculture.—Boundless forests exist, the area of the forest land in Europe being 42 per cent. of the total area. The fir, larch, alder, and birch predominate. In the S. forests are less abundant and the tracts around the Black Sea and the Caspian, and the immense steppes of the S. and E., are almost wholly destitute of wood. Most of the forest land before the World War was under government control. Agriculture is the chief pursuit of the bulk of the population. The chief crops are rye, wheat, barley, oats, hemp, flax, and tobacco.

Zoölogy.—Among wild animals may be mentioned the bear, the wolf, wild hog, elk, and various animals which are hunted for their furs. Wild fowl abound, particularly near the mouths of rivers. In the Arctic Ocean vast num-

bers of seals are taken. The rivers of the Caspian, particularly the Ural and Volga, and the Sea of Azof, are celebrated for their sturgeons. In the same quarters are also important salmon fisheries. In the regions bordering on the Arctic Ocean large herds of reindeer are kept; and in the S., among the Tartars of the Crimea and the inhabitants of the Caucasus, the camel is often seen.

Minerals.—Russia is rich in minerals. The precious metals are chiefly obtained in the Ural and Altai regions. In the Ural, iron beds are also rich and numerous, exceeding all others in productiveness. Copper is most abundant in the government of Perm; lead in the Ural and some parts of Poland; saltpeter in Astrakhan. Of the coal mines those of the Don basin are the principal, those of Kielce ranking second; the mines around Moscow come next. About 60,000 tons of manganese ore were annually extracted in the Ural and the Caucasus. The petroleum wells of Baku on the Caspian before the World War sent their products all over Europe.

Manufactures.—Prior to the accession of Peter the Great, Russia had no manufactories; he started them, and under the more or less fostering care of his successors and Russia's protective policy they steadily grew. Manufactures were in a chaotic state under the Soviet Government and no statistics of production were available. It was well known, however, that nearly 75% of the manufacturing establishments had ceased operations. In 1915, the latest date for which statistics were available, there were 14,056 manufacturing establishments, employing 1,600,860 persons.

Commerce.—The bulk of Russia's external trade was carried on through the European frontier and the Baltic and Black Sea ports. The chief exports were grain (about one-half of entire exports), flax, linseed and other oleaginous seeds, timber, hemp, wool, butter and eggs, spirits, bristles, and furs, in the order indicated. The chief imports were cotton, wool, tea, machinery, coal and coke, cotton yarn, metal goods, wine, olive oil, raw silk, herrings, textile goods, fruit, coffee, tobacco. The import trade was heaviest with Germany, Great Britain, France, Austria-Hungary, and Belgium, in the order named. In the export trade Great Britain took the lead, Holland, France, Germany following. The development of the vast natural resources and trade of Russia is prevented by transport difficulties. The magnificent river and canal system is not available for a good part of the year, and railways are comparatively limited. No statistics of commerce are available later than 1916. The Soviet Government endeavored to bring about commercial relations between it and other European countries, as well as the United States, and proposed such an arrangement with Great Britain in March, 1921. The total lack of raw materials essential to manufacturing prevented the exportation of goods of any appreciable value.

Transportation.—There were in 1920 about 36,000 miles of railway in European Russia, and 10,586 in Asiatic Russia. Practically all lines were under the control of the government. Railway operation had become so thoroughly disorganized as to be almost useless. The Soviet Government gave large concessions for railway construction to syndicates in Norway and the United States, but no active work had been undertaken in relation to these at the end of 1920.

Finances.—The financial system suffered entire collapse during the Soviet rule. Issues of paper money had reached colossal figures and these had become of little value. The ruble depreciated until it became almost without value. As a result of this condition prices of commodities had mounted at a terrific rate. The revenue for 1919 was 48,000,000,000 rubles and the expenditure 230,000,000,000 rubles. The total debt amounted to over 32,300,000,000 rubles. The total estimated cost of the war for Russia is about £5,000,000,000.

Army and Navy.—There were no trustworthy figures of the strength of the Soviet army. By the decree of Feb. 1, 1918, the government established a Workers and Peasants Red Army Volunteers and this was brought under the guidance of regular officers of the old Russian army and assumed a fair state of efficiency. The Bolshevist armies were uniformly successful during the second half of 1919. (See HISTORY below.) The full strength of the Bolshevist army was estimated at 600,000 men, with a reserve and other forces amounting to another 700,000. These forces were organized into 13 armies, of which 5 are in the eastern front, chiefly in Siberia, 5 in the southern front, and the remaining 3 on the northern and western fronts. The navy figured little in the operations of the Bolshevist Government. Attempts were made by General Denikin in 1919 to organize the Black Sea Fleet, but this failed. The Baltic Sea Fleet fell completely into the hands of the Bolshevist Government and was used entirely for defensive purposes.

Government.—The so-called Russian Socialist Federal Soviet Republic is nominally governed by a constitution adopted by the Fifth All-Russian Soviet

Congress in July, 1918. According to the terms of this constitution Russia is a republic of soviets of workers, soldiers, and peasant delegates, and the central and local authority is vested in these soviets. Private property in land is abolished, all land being common property of the people. The state owns all factories, mines, railways, and other means of production and transport. The highest authority in the state is the All-Russian Congress of Soviets, which consists of representatives of town soviets, on the basis of one delegate for each 25,000 electors, and a provincial council of soviets on a basis of one delegate for each 125,000 inhabitants. The Congress elects the All-Russian Central Executive Committee, consisting of not more than 200 members, which constitutes a supreme legislative, administrative, and controlling body of the republic. This executive committee also forms a Council of People's Commissioners, for the general administration of the affairs of the republic, consisting of commissariats of foreign affairs, war, navy, interior, justice, labor, social relief, public instruction, posts and telegraphs, nationalities, finance, transportation and communications, agriculture, commercial industry, food supply, state control, a supreme economic council, and public health. The franchise is nominally enjoyed by all citizens over 18 years of age who earn their livelihood by productive labor and by soldiers, sailors, and the Soviet Army and Navy.

Religion.—The Soviet Government disestablished the church and appropriated all its property. All religions, however, may be freely professed in the empire.

Education.—In December, 1917, the Soviet Government secularized all schools and educational institutions. Several new universities were established under the Bolshevist Government. Elementary education is poorly developed.

People.—The population of Russia up to 1914 was increasing faster than that of any other European nation, Great Britain, perhaps, excepted. As regards language (and so far also race) the peoples of Russia were comprised under the two great divisions of Aryans and Mongolians; the former include Slavonians, Germans, and Greeks, the latter the Finnish and Tartar races. The Slavonians formed about 75,000,000 of the population. The Turco-Tartars counted about 10,000,000. The political divisions of the Russian people comprised numerous grades of nobility, which were partly hereditary and partly acquired by military and civil service, especially the former, military rank being most highly prized in Russia. The clergy, both regular and secular, formed a separate privileged order. Previous to the year 1861 the mass of the people were serfs subject to the proprietors of the soil. The Emperors Alexander and Nicholas took some initial steps toward the emancipation of this class; but a bold and complete scheme of emancipation was begun and carried out by Alexander II. in 1861.

Language.—A number of languages and a vast variety of dialects are spoken, but the Russian is the vernacular of at least four-fifths of the inhabitants, the literary and official languages being specifically the "Great Russian," or that belonging to Central Russia surrounding Moscow. It has an alphabet of 37 letters, a written and printed character of a peculiar form, and a pronunciation which it is hardly possible for any but natives to master.

History.—The origin of the Russian empire is involved in much obscurity, but it is usually regarded as having been founded by Rurik, a Scandinavian (Varangian), about 862, his dominions and those of his immediate successors comprising Novgorod, Kieff, and the surrounding country. Vladimir the Great (960–1015), the Charlemagne of Russia, introduced Christianity and founded several cities and schools. For more than two centuries Russia continued subject to the Tartars, while on its opposite frontier it was exposed to the attacks of the Poles and Teutonic knights, but in 1481 the Tartars were finally expelled under Ivan the Great (1462–1505). Ivan the Terrible (1533–1584) did much to extend and consolidate the Russian territory, and in particular began the conquest of Siberia, which was completed in 1699. In 1613 the house of Romanoff, whence the late Czar Nicholas was descended, was raised to the throne, and from this period the empire gained greater strength and consistency. But Russia's real greatness may be said to date from the accession of Peter the Great in 1689, who first secured for the country the attention of the more civilized nations of Europe. From then on the growth of the empire was continuous. The three partitions of Poland took place under Catherine II. in 1772, 1793, and 1795. Russia acquired nearly two-thirds of this once powerful state. By the peace of Kutchuk-Kainarji in 1774, the Turks gave up Azof, part of the Crimea (the other part was taken possession of in 1783), and Kabardah; and by the peace of Jassy in 1792, Oczakov. The peace of Fredericksha-ven, 1809, robbed Sweden of the whole of Finland, which now passed to Russia; the peace of Bucharest, 1812, took Bes-

sarabia from the Turks; that of Tiflis, 1813, deprived the Persians of parts of the Caucasus; and then the Vienna Congress of 1815 gave the remainder of Poland to Russia. The desire to possess further dominions of the Sultan led to a war against Turkey in 1853, in which England, France, and Sardinia also took part in 1854, and which ended in the peace of Paris, 1856. (See CRIMEAN WAR.) In 1858 Russia acquired, by agreement with China, the sparsely populated but widely extended district of the Amur. A ukase of 1868 annihilated the last remains of the independence of Poland by incorporating it completely in the czardom. On the other hand, Russian America was sold to the United States in 1867.

In 1877 Russia declared war against Turkey, ostensibly to free the Bulgarians from Turkish misrule. The military operations terminated in the following year in favor of Russia, whose forces reached the gates of Constantinople, where, at San Stefano, on March 3, 1878, a treaty was agreed to whereby Turkey would have been practically expelled from the whole European continent. The treaty was radically revised a few months later at Berlin, largely at the instigation of Great Britain and Germany, with the result that Russia was brought to realize that she could not hope to reach her much-desired outlet to the open sea by way of the Balkan Peninsula with the consent of the other Great Powers. It then became a policy of the Imperial Government to seek this outlet in the Far East.

In May, 1896, a treaty was made with China permitting the construction of a railroad by Russia through Manchuria, and the Liao-tung ports, Talien-wan and Port Arthur were placed at the disposal of the Russian Government for commercial purposes. These privileges Russia sought constantly to enlarge. To what extent these encroachments on Chinese sovereignty might have extended is not a matter of history, for gradually the pretensions of Russia in the Far East clashed with those of Japan, terminating in the Russo-Japanese War, in 1904, with the result that Russian expansion was effectually checked in this direction.

Meanwhile domestic troubles were assuming a share in shaping the destiny of the Empire. The first popular discontent with the autocracy of the Russian Government manifested itself in the early 70's, shaping itself into that revolutionary movement which was generally known under the name of Nihilism. At first this was merely a disorganized protest against the degraded state of the peasantry on the part of young university students and the sons and daughters of the liberal land-owning class. These youthful enthusiasts began establishing informal schools among the villagers, in which nothing more harmful than reading and writing were taught. Much has been said of the liberality of Alexander II., at that time Czar, who had indeed signed the decree liberating the serfs, in 1861, but the fact remains that his counsellors initiated a very severe policy of repression against these harmless educators of the common peasants. Finally, after one of them, a woman, had been disrobed and subjected to degrading punishment by a Russian chief of police, the Nihilists resorted to terrorism—assassination. One after another the higher officials, known to be in sympathy with the policy of suppression, were picked off by the Nihilists, with the result that this underground warfare, the secret police on the one side, the Nihilists on the other, became more and more acute. Finally, on March 13, 1881, the Czar himself was slain by one of the conspirators, who at the same time sacrificed his own life by being blown up with the same bomb that destroyed the autocrat.

So strenuous became the efforts of the secret police after this event that the Nihilists were practically cleaned out of Russia; the majority were killed, hanged or sent to Siberia, while a small minority escaped into exile abroad, mostly to England, Switzerland and Bulgaria. For the following ten years or more there was comparative quiet in Russia. Gradually, however, shortly before the close of the century, the revolutionary movement began again to manifest itself, this time through the more thoroughly organized Social Democrats and Social Revolutionists, who represented ideas more definite than a mere blind protest against the tyranny of the autocracy. The latter represented largely the same elements which had composed the Nihilists; the sons and daughters of the minor nobility and university students. While all were radicals, imbued with the principles of Socialism, they were more directly concerned with the peasantry, whose lot they sought chiefly to improve and whom they hoped to inspire to revolutionary uprisings.

The Social Democrats represented the Marxian Socialists, who believed that the salvation of society lay in the hands of the industrial workers. Many of their leaders were young Jews who had gone abroad, especially to Switzerland and Germany, to acquire the university education which was denied them by the country of their birth. The government's policy of persecution of the Jews, re-

sulting in the heavy emigration of these people to the United States, also tended to throw many thousands of them into the ranks of the Social Democrats, which in turn brought on still more severe measures of repression against them from the government.

The weakness of the government, revealed by its inability to cope with the war situation in Manchuria, in 1905, served as the occasion for the first serious outbreak of revolutionary activities in Russia. Thousands of the Russian soldiers who had been taken prisoners by the Japanese, were exposed to the propaganda of the Socialist agitators in the Japanese prison camps, and when they returned to Russia, after the signing of peace, in August, 1905, they lost no time in joining in the demonstrations of the revolutionists.

In the previous January a large delegation of workers had presented itself before the palace of the Czar, in Petrograd, with a peaceful petition for certain reforms. The authorities made the almost fatal mistake of firing on the delegation, numbering some thousands, headed by a priest, Father Gapon, killing and wounding hundreds. This fateful day was ever afterward known as "Red Sunday." It formed the starting-point of the real Russian revolutionary movement.

In February the Grand Duke Sergius was assassinated. Many smaller assassinations followed. More important still, strikes of the workers were called, and, in spite of severe repressive measures, tended to blend into one great, general strike. Finally the Czar signed a ukase calling into existence a popular assembly, the Duma, with little more than the right to hold debates, however. Still the strike augmented. In Moscow Leon Trotzsky, one of the Social Democrat leaders, organized the first Council, or Soviet, of Workingmen Delegates (see COUNCIL OF WORKINGMEN AND SOLDIERS), and this body proceeded to initiate an armed uprising.

By this time, Oct. 31, the Government was thoroughly alarmed, and now a decree was passed granting a genuine constitutional government.

Only gradually, however, did the disorders, by this time extending all over the empire, quiet down. The Moscow uprising was terminated only after severe bloody encounters between the police and soldiers and the revolutionists. Finally the elections were held and the Duma assembled in Petrograd. It was allowed to proceed unmolested, until the disorders had more or less ceased, and then, in July, 1906, the Duma was dissolved by an imperial ukase The decree frankly stated that the Duma had attempted to interfere with the fundamental laws of the country, which could only be changed by the will of the Czar, and this could not be tolerated.

Then followed a renewed spurt of activity of the secret revolutionary organizations, and high officials were killed almost daily. A new Duma was called, but the restrictions on suffrage were so arranged that there was little danger of the members again attempting to interfere with the prerogatives of the autocracy. It was a thoroughly subservient body, and so remained until after the outbreak of the World War, in 1914.

Meanwhile the war on the revolutionary elements was continued with energy. The discovery that a large number of the chief leaders of the revolutionary organizations were the paid agents of the government, more than the repressive measures, tended to their utter demoralization, and in 1907 reaction was again triumphant in Russia. The leaders who had been compromised had taken refuge abroad, while those who found it possible to remain in Russia turned their attention to the Co-operative Movement, hoping to accomplish by economic action what they could not accomplish by terrorism or political action.

On July 28, 1914, Austria-Hungary declared war on Serbia. It was Russia's policy to oppose and prevent the further expansion of the Austrian Empire at the cost of any of the Southern Slav peoples. Russia, therefore, began an immediate mobilization of her troops, which brought forth a protest from Germany, Austria's ally. On August 1, 1914, Germany declared war on Russia, and the great World War was precipitated. On August 6, 1914, Austria-Hungary declared war on Russia.

The Russian army had been reorganized on a more efficient basis since the Russo-Japanese War, though perhaps not so extensively as was popularly supposed among the public of the Allied countries. The Russian armies were able to hold their own against the forces of the Central Empires on the Eastern front for two years or more, but at a tremendous cost to the Russian economic structure. Nor would it have been possible for Russia to have accomplished as much as she did had the war not had popular support. Many of the former revolutionary leaders in exile returned to Russia to give their support, though the autocracy was short-sighted enough to have many of them arrested on their arrival.

It was within the inner government circles that the seed of ultimate disintegration germinated. Very soon after the outbreak of the war many of the

reactionary officials, some of whom were descendants of the Germans, brought to Russia by the Empress Catherine, realized that the defeat of German Imperialism would also be a defeat for Russian autocracy. This group of traitors had the support of the German Czarina. Chief of these "dark forces" was a favorite of the Czarina, a monk by the name of Razputin, who had gained his ascendency over the weak-minded Czar and the Czarina because of his reputed healing powers over the little Czarowitch, who was constitutionally diseased.

Gradually it became generally realized that this inner court circle was working for the defeat of the Russian forces in the field. The Liberal elements in the Duma combined with the radical minority, and began to protest. This bloc gradually gained the support of even the more intelligent reactionaries, including several of the Grand Dukes, who attempted to warn the Czar of the danger from within, though without effect. Late in December, 1916, Razputin was assassinated by a group of those former reactionaries who had now joined the Liberal elements against the dark forces, one of the assassins being the Grand Duke Dimitri Pavlovitch, and another being A. N. Khvostov, formerly Minister of the Interior. But Razputin's removal was accomplished too late. His intrigues were taken up by Alexander Protopopov, Minister of the Interior, who now set to work determinedly to accomplish the disintegration of the Russian efforts against Germany. This he attempted to do by arousing revolutionary activities among the workers in the war industries, hoping that the blame would be placed on the radical elements. The latter, however, raised a protest, and were easily able to prove their innocence. Protopopov worked to create disorders which would have to be suppressed by the troops, creating a domestic situation which could be the pretext for a separate peace with Germany. One of his chief tactics to bring about the disorders was to withhold shipments of food from the capital.

In the first week of March, 1917, he had so far succeeded that the people began demonstrations in the streets against the government. The police and the troops were ordered to fire on the demonstrators. The troops, however, refused to do so, and then openly joined the uprising. Thus Protopopov's plan was completely upset. The Duma thereupon repudiated the government and proclaimed a new Provisional Government, which a few days later forced the Czar to abdicate. The radical elements at the same time organized the Council, or Soviet, of Workingmen's Delegates, which shared with the Duma in the establishment of the Revolutionary Government. Prince George Lvov, and Paul Miliukov, both Liberals, were made, respectively, Premier and Foreign Minister of the Provisional Government, on March 15, 1917. On March 22 the United States formally recognized the Revolutionary Government of Russia.

The Provisional Government first declared Russia a republic, under a constitutional government, and announced itself as determined to continue the war against the Central Empires to a victorious conclusion. On May 13, 1917, the cabinet of the Revolutionary Government was reconstructed, and Alexander Kerensky, a Socialist, and previously Minister of Justice, became Premier and War Minister.

Kerensky attempted to reorganize the shattered Russian military forces and in the following July attempted an offensive against the Germans and Austrians. For a week this attempt seemed likely to succeed, then suddenly crumpled, because of the refusal of a large proportion of the troops to fight. The Russian peasants composing the Russian armies were exceedingly war weary and, moreover, under the encouragement of certain elements in the Council of Workingmen (and soldiers') Delegates, had begun to question the aims of the war.

It was this tendency in the minds of the soldiers which gave the ultra-Marxian Socialists, the extreme left of the Social Democrats, their opportunity. Under the leadership of Nikolai Lenin, leader of this faction of the extreme left, known as the Bolsheviki, an intensive propaganda was carried on among the soldiers for the overthrow of the Provisional Government and the establishment, in its place, of a Socialist Government which should be represented solely by the Council of Workingmen's and Soldiers' Delegates, better known as the Soviet. The Bolsheviki might not have succeeded in their plans, had it not been that in September General Kornilov, Commander-in-Chief, attempted to overthrow the Kerensky Government and proclaim a military dictatorship in its stead. Fear of a return of Czarism threw the rank and file of the army over to the Bolsheviki, and on Nov. 7, 1917, the Provisional Government was overthrown in Petrograd and the Soviet was proclaimed the supreme authority, with Lenin as Premier and Leon Trotzsky Minister of Foreign Affairs. Steps were at once taken to secure peace with Germany, at first a general peace, then, the Allies having refused to respond, a separate peace. On Dec.

15, 1917, the Bolsheviki Government came to an agreement with Germany and her allies for an armistice. Immediately after peace negotiations were instituted at Brest-Litovsk. These lasted until Feb. 10, 1918, when the Russian delegates withdrew, refusing to accept the German terms, because the German Government refused to withdraw its forces from the Baltic provinces and allow their people to decide by plebiscites what form of government they desired. The Germans immediately, after the expiration of the armistice period, on Feb. 18, began an advance eastward into Russia, and the Soviet Government of Russia was forced to plead for a renewal of negotiations. This the Germans agreed to only after they had advanced a considerable distance, and then the Soviet was forced to accept terms extremely severe, including not only German occupation of the Ukraine and the Baltic provinces, but a heavy indemnity. Peace on these terms was finally declared, on March 3, 1918.

The impression now seemed to prevail in the Allied countries that the Soviet Government was not only submissive to Germany, but more than willing to play its game against the Allies. England, France, Japan and, later, the United States, thereupon came to an agreement of intervention in Russia. The ostensible reason given was to rescue the Czecho-Slovak contingents of the Russian Army in Siberia and the Urals, which had turned on the Bolsheviki Red Guards and were fighting their way toward Vladivostok. In August, 1918, Allied troops, and 7,000 United States regulars landed at Vladivostok and began an invasion of Siberia. At the same time an anti-Bolshevik Russian Government was set up in Siberia, at Omsk, constituted of Liberal and radical elements, but later superseded by the dictatorship of Admiral Kolchak, who had previously been in command of the Russian Black Sea Fleet, before it had been taken over by the Bolsheviki. Already, in July, 1918, Allied troops, including Americans, had been landed in northern Russia, on the Murmansk Peninsula, with the object of countering the Germans in Finland. These were now considerably augmented, and an offensive against the Bolsheviki was begun to the southward, but never with any success. Here a provisional government of North Russia was set up, with Nicholas Tchaikovsky, the old Nihilist leader, as Premier, but it never received popular support, and lasted only as long as the foreign occupation.

At the same time General Denikin, a Cossack leader in the S. of Russia, initiated a campaign from the Don region against Moscow. He was plentifully supplied with munitions from the British Government.

On July 5, 1918, the German Ambassador to Moscow, von Mirbach, was assassinated by Social Revolutionists, who were attempting to overthrow the Soviet. Similar attempts were made against high Soviet officials, one against Lenin. The Bolsheviki thereupon began a campaign of suppression which was known as the Red Terror. The Soviet had nationalized practically all industry and the banks, and was attempting to establish a Socialist Republic based on Marxian principles.

The defeat of Germany freed the Soviet Government from its obligations to the German Government and liberated the Ukraine from German control and occupation. Leon Trotzsky had been appointed Bolshevik Minister of War, and he now set to work with remarkable energy to organize an effective Red Army, with notable success. The Soviet forces now turned on their enemies on all fronts, and one after the other defeated them. In June, 1919, the United States decided to withdraw its troops from North Russia, and a few months later the British followed. By the end of the year the Bolsheviki had completely cleaned up what remained of this front. In Siberia the Czecho-Slovaks had shown themselves disgusted with the Kolchak dictatorship, and gradually withdrew. In the fall of 1919 the Soviet forces turned on Kolchak with full force, and before the end of the year he had been completely crushed, the dictator himself being executed. A few months later Denikin, in the S., was routed and compelled to retire, his forces having melted to almost nothing through desertions.

In January, 1920, the Supreme Council in Paris offered to resume trade with Soviet Russia through the Co-operative Movement, which carried on all distribution and a large part of the manufacturing activities which could be undertaken in the country. The Soviet Government immediately nationalized the Co-operative enterprises, and sent a trade delegation to London, to negotiate the reopening of trade relations. In the latter part of 1920 an agreement was reached between the Soviet Government and Great Britain whereby trade was to be resumed early in 1921.

Meanwhile, in the spring of 1920, relations between the Soviet Government and Poland became strained, and the situation suddenly changed into open hostilities when, early in March, 1920, the Poles began an offensive against the

Russians, succeeding in advancing as far as Kiev, in the Ukraine. Though at first thrown back, the Soviet forces suddenly rallied and initiated a counter-offensive, which turned the tables on the Poles, who all but lost their capital, Warsaw, during the following summer. Taking advantage of the Polish attack, General Baron Wrangel, a lieutenant of Denikin, had organized an army in the Crimea and begun an attack on the Bolsheviki from the south. Hurriedly the Soviet made peace with Poland, in November, 1920, and turned on Wrangel, whose forces were completely defeated in the early part of November, 1920.

By Jan. 1, 1921, the Soviet Government had triumphed over all its enemies from outside, and was faced with the task of demobilization. The situation in the interior of Russia, economically speaking, had sunk into a deplorable state, especially in transportation facilities. The population was suffering severely from short rations. The removal of outside pressure, which had brought all elements of the Russian population to the support of the Soviet Government, was removed, and the latter had now to face counter-revolutionary activities from within.

RUSSIA LEATHER, a kind of leather originally made in Russia from the skins of goats and sheep.

RUSSNIAKS. See RUTHENIANS.

RUSSO-JAPANESE WAR. After the Boxer movement in China, Russia obtained from China a concession to build a railway in Manchuria, and hence allowed Russian troops to remain in that province to maintain order. Japan objected to the presence of Russia's army in Manchuria, and insisted upon evacuation. To this Russia would not agree, and after exhausting all diplomacy, the Japanese minister at St. Petersburg, Feb. 1, 1904, declared diplomatic relations at an end. At the same time the Russian minister at Tokio prepared to leave the Island Empire. The next day, forty Japanese transports were loaded with troops to be landed at various points in Korea. Also a naval division sailed from Japanese waters, and by the flagship of this fleet the first shot in the war was fired, on the night of Feb. 8. The Japanese admiral, Togo, sent a flotilla of torpedo boats into the harbor of Port Arthur to attack the Russian fleet. Japan had waived the formality of a declaration of war, and the sudden attack was wholly unexpected by the Russians. Admiral Stark, in command of the Russian fleet, and many of his officers, were on shore at places of amusement, and with the first shot the fleet was thrown into the utmost confusion. Defeat ensued for the Russians, who lost a battleship and two cruisers. The Japanese torpedo boats escaped unharmed. The next day the Japanese fleet opened a bombardment on the forts and ships at Port Arthur, and from that time forward, through the first three months of the war, the Japanese continued the bombardment at intervals of a few days —nine attacks in all—without effect. On Feb. 9, a division of the Japanese fleet, under Admiral Uriu, appeared outside the harbor of Chemulpo, Korea, and the Russian cruiser "Variag" and the gunboat "Korietz" came out in the hope of escaping in a running fight. Both the Russian vessels, however, were crushed by weight of metal, and both crawled back to the harbor, where they blew up and sank. Admiral Makaroff was later appointed to the supreme command of the Russian fleet, and General Kuropatkin reached Harbin, Manchuria, in April, to assume command of the Russian land forces. On April 13 the Russian fleet met with a disaster that was regarded in Russia as a national calamity. The battleship "Petropavlovsk," with Admiral Makaroff aboard, while steaming out of the harbor of Port Arthur to attack the Japanese fleet, struck a mine, the ship turned turtle, after blowing up, and Makaroff and nearly the entire ship's company were drowned. On May 27-28, 1905, Admiral Rojestvensky's fleet was utterly annihilated by the Japanese navy in Tsushima Straits, with the deaths of 4,000 Russians and the capture of twice as many, and insignificant loss on the other side. This ended the war, and peace was signed at Portsmouth, N. H., on Sept. 5. Russia lost 400,000 soldiers and 83 ships of war, Japan 170,000 soldiers and 19 ships of war, and obtained half of the Saghalien Islands as compensation. Other provisions of the treaty called for the evacuation of Manchuria, Russian acknowledgment of Japan's paramount interests in Korea, Japan to take over Port Arthur, Dalny, and the Liao-tung Peninsula, and to control the Chinese Eastern railroad S. from Kunshien, which is 10 miles S. of Harbin.

RUST, the yellowish coat of peroxide which forms on the surface of iron exposed to moist atmosphere. To prevent the rusting of iron utensils, oil, paint, varnish, plumbago, grease, or any substance which will protect the metal from the moist air, may be employed. In all ordinary circumstances iron decomposes water, abstracts the oxygen, and combines with it, thus forming rust.

In botany, a disease of plants, which shows itself on the stems and leaves of many plants, and on the ears of grasses, both of the cereal grasses and of many pasture and forage grasses, in brown, yellow, or orange colored spots, and after destroying the epidermis of the plant assumes the form of a powder which soils the fingers when touched.

RUSTCHUK, a town of Bulgaria; on the right bank of the Danube, where that river is joined by the Lom, opposite Giurgevo, and 42 miles S. W. of Bucharest. Pop. about 36,000.

RUSTIC WORK, an imitation of rough or primitive work; furniture for summer houses and lawns, made of limbs and trees, taking advantage of natural crooks to form the shapes desired.

RUTACEÆ, rueworts; the typical order of *Rutales;* trees, shrubs, or rarely herbs, with opposite or alternate, simple or compound leaves, covered with pellucid resinous dots; calyx in four or five divisions; petals as many, distinct or combined into a tube, or wanting; tribes, *Cuspariex, Pilocarpex, Boronicæ, Eudiosmex, Dictamnex, Ruteæ*, and perhaps *Cneoreæ*. Genera, according to Lindley, 47; species, 400.

RUTGERS COLLEGE, an educational institution in New Brunswick, N. J.; founded in 1766, under the auspices of the Dutch Reformed Church; reported at the close of 1919: Professors and instructors, 75; students, 460; volumes in the library, about 100,000; number of graduates, 2,900; president, William H. S. Demarest, LL.D.

RUTH, a canonical book now placed in the Hagiographa of the Old Testament, between the Song of Solomon and the Lamentations. The English Bible, following the Septuagint and the Vulgate, arranges it between the Books of Judges and Samuel. During the times of the Judges, a certain Elimelech, of Bethlehem-Judah, *i. e.*, of Bethlehem in Judah, as distinguished from Beth-lehem in Zebulun (Josh. xix. 15), to escape a famine then raging, went to Moab with his wife Naomi, and his two sons, Mahlon and Chilion, who married two Moabitesses, Orpah and Ruth. There all the male members of the family died, and the widowed Naomi, hearing that the famine was over, thought of returning home. Orpah, after starting with her, was prevailed on to return; Ruth, the heroine of the narrative, could not be persuaded to go back, and having, after reaching Bethlehem, gone into the fields as a gleaner, she attracted the notice of Boaz, an aged kinsman, with whom she made a romantic marriage, ultimately becoming the great-grandmother of King David and an ancestress of Jesus Christ (Matt. i. 5). The Book of Ruth is a beautiful idyllic composition. It was penned not earlier than the time of David (ch. iv. 22), and probably much later, for there had been time for customs existent in the days of Boaz and Ruth to change. The narrative is in pure Hebrew, but there are Aramæanisms in the dialogues. Most critics place its composition before, but Ewald during, the Exile. Its canonicity has never been doubted.

RUTHENIANS, a Slavonic branch of Little Russians. About 3,500,000 dwell in Galicia, over 400,000 in Hungary, and 300,000 in Bukowina. Most of them now belong to the new state of Czecho-Slovakia.

RUTHENIUM, a tetrad metallic element discovered by Osann in 1828, in the platinum ores from the Ural, and first isolated by Claus in 1845. Symbol, Ru.; at. wt., 101.7. It occurs chiefly in osmiridium, and is separated from the latter by heating to redness a mixture of this ore and common salt in a current of moist chlorine. By digestion in cold water an extract is obtained from which ammonia throws down the oxides of ruthenium and osmium. The latter is expelled by heat, and the former converted into ruthenate of potassium by fusion with potash, which yields oxide of ruthenium on addition of nitric acid. On ignition in a stream of hydrogen the oxide is reduced to the metallic state in the form of porous fragments. With the exception of osmium it is the most refractory of all metals, but can be fused in the hottest part of the oxy-hydrogen blowpipe. It then has a density of 11 to 11.4, and is scarcely attacked by nitro-muriatic acid.

RUTHERFORD, a borough of New Jersey, in Bergen co. It lies between the Passaic and Hackensack rivers, and is on the Erie railroad. It is almost entirely a residential place. Pop. (1910) 7,045; (1920) 9,497.

RUTHERFORD, SIR ERNEST, a British physicist, born in Nelson, New Zealand, in 1870. He was educated at Nelson College, and at Canterbury College, New Zealand, and took post-graduate courses at Trinity College, Cambridge. He was professor of physics at McGill University, from 1898 to 1907, and was professor and director of the physical laboratory at the University of Manchester. He received the Rumford medal from the Royal Society in 1904, and the Barnard medal in 1910. In 1908 he received the Bressa prize from the

Turin Academy of Sciences, and also the Nobel prize in 1908. In the same year he was made a knight. His scientific work related chiefly to radio activity. His works include. "Radio-Activity" (1904); "Radio-Active Transformations" (1906); and "Radio-Active Substances and Their Radiations" (1912).

RUTHERFORD, or **RUTHERFURD, SAMUEL**, a Scotch divine; born in Nisbet, Scotland, about the year 1600. He studied at Edinburgh University, and in 1627 was appointed minister of Anwoth in Kirkcudbright. On account of his strong Presbyterian views he was deprived of his living in 1636 and imprisoned for two years, when he was restored. He took a prominent part in the drawing up of the National Covenant. In 1639 he became Professor of Divinity, and in 1649 principal of the new college, St. Andrews. He published numerous politico-theological treatises. The most famous of these is "Lex Rex" ("The Law, King"), which on the Restoration was publicly burned and he himself charged with high treason. Death prevented him from answering the charge before Parliament. His familiar "Letters" have been frequently reprinted. He died in Edinburgh, March 23, 1661.

RUTHERFURD, LEWIS MORRIS, an American astronomer; born in Morrisania, New York City, Nov. 25, 1816; was graduated at Williams College in 1834; admitted to the bar in 1837; and practiced in New York till 1849, when he retired from practice to devote himself to travel and the study of astronomy. He made a number of instruments for his observatory, among which were an object glass which proved a great success, a micrometer for the measurements of astronomical photographs, a ruling engine with which he produced interference gratings on glass and speculum metal. He retired from active astronomical work in 1883, and presented his instruments to Columbia College. He was one of the original members of the National Academy of Sciences. He died in Tranquillity, N. J., May 30, 1892.

RUTHERGLEN, a royal, parliamentary and municipal burgh in Scotland. It is situated in the county of Lanark, on the Clyde, 3 miles S. E. of Glasgow. It figures in Gaelic mediæval history, and to-day is an industrial center with coal mines and iron and steel works. The oldest church goes back to the twelfth century. Pop. about 25,000.

RUTILE, a widely distributed mineral, occurring mostly in crystals, occasionally massive; crystallization tetragonal; much twinned, by repetition of the same twin often assuming a geniculated appearance; hardness, 6 to 6.5; sp. gr., 4.18 to 4.25; luster, metallic-adamantine; color, red to reddish-brown, yellowish-black; streak, brown; transparent to opaque; fracture, sub-conchoidal to uneven; composition: oxygen, 39; titanium, 61=100, corresponding with the formula TiO_2. Dana divides this species into: (1) ordinary, which includes the brownish-red and other shades; sp. gr., 4.18–4.22, and the acicular varieties often inclosed in rock crystal; (2) ferriferous; color black (*a*) nigrine, (*b*) ilmenorutile; (3) chromiferous, color grass-green, owing to oxide of chromium. Found distributed in granite, gneiss, mica-schists, and sometimes in granular limestones.

RUTLAND, a city and county-seat of Rutland co., Vt.; on Otter creek, and on the Rutland, the Delaware and Hudson, the Central Vermont, and the Bennington and Rutland railroads; 50 miles S. W. of Montpelier. Here are an English and Classical Institute, the Baxter Memorial Reference Library, Rutland Free Library, State House of Correction, city hospital, court house, United States Government building, the first State Capitol (built in 1784), a State penitentiary; waterworks, street railroad and electric light plants, National and savings banks, and several daily and weekly newspapers. It is in a region rich in limestone, and marble has been quarried here since 1830. West Rutland, which was set off from Rutland in 1886, is the center of the marble interest. Besides its marble industry, Rutland has extensive scale works, iron works, and shirt and school furniture factories. In 1784–1804 Rutland was one of the State capitals. During the Revolutionary War it was on the frontier. Pop. (1910) 13,546; (1920) 14,954.

RUTLEDGE, EDWARD, an American statesman; born in Charleston, S. C., Nov. 23, 1749; was admitted to the bar in 1773; began practice in his native town; was a member of the Continental Congress in 1774–1777; took a conspicuous part in the discussions preceding the adoption of the Declaration of Independence, of which he was a signer; was on a commission with John Adams and Benjamin Franklin which met Lord Howe, Sept. 11, 1776, on Staten Island, but refused to enter into any treaty with him except on the basis of American independence. He was lieutenant-colonel of the Charleston Artillery which aided in expelling the British from the island of Port Royal in 1779; and was captured in 1780 and imprisoned for a year in St. Augustine. At the conclu-

sion of hostilities, he resumed the practice of law in Charleston; and was elected governor of South Carolina in 1798. He died in Charleston, S. C., Jan. 23, 1800.

RUTLEDGE, JOHN, an American jurist, brother of Edward; born in Charleston, S. C., in 1739. He was a member of the South Carolina convention of 1774 that decided to take part in the Continental Congress, and a delegate to the latter body in 1775; chairman of the committee that framed the South Carolina constitution in 1776, and elected that year president of the new State government and Commander-in-Chief of the militia. In 1778 he was again elected governor of South Carolina. In 1780, when Charleston was captured by the British, he retired to North Carolina, joining Greene's army; but resumed the governorship at the close of the war. In 1782 he was elected to Congress, and re-elected in 1783. He was a member of the convention that framed the Constitution of the United States. In July, 1795, he was appointed by Washington Chief Justice of the Supreme Court and served the August term of that year; but his mental faculties failing, he was not confirmed by the Senate in December. He died in Charleston, July 23, 1800.

RUVO DI PUGLIA, a town in the province of Bari, Italy, 20 miles W. of the city of Bari, famous for its production of potteries, and as a center of a fertile region producing grains and fruit. Pop. about 25,000.

RUWENZORI, a chain of mountains in Central Africa, slightly N. of the equator, discovered by Henry Stanley in 1888, when he rescued Emin Pasha. Some of the higher peaks have an altitude of 16,000 feet and are covered by perpetual snow, while many of the valleys are packed with glaciers. The main chain lies two hundred miles west of Victoria Nyanza, between Albert Nyanza and Edward Nyanza, extending into the Belgian Congo.

RUYSDAEL, or **RUISDAEL, JAKOB,** a Dutch landscape painter; born in Haarlem, Holland, about 1625. In 1648 he was enrolled a member of the guild of St. Luke at Haarlem, and in 1659 was granted the freedom of the city of Amsterdam. His works are very picturesque in detail. He had a fine feeling for the poetic spirit of nature, which he embodies with great skill. His pictures exist in Dresden, Berlin (probably the two best collections), the Louvre, the London National Gallery, Amsterdam, and The Hague. He left a few etchings, which are highly prized. He died in the almshouse of Haarlem, March 14, 1682.

RUYTER (roi'ter), **MICHIEL ADRIAANSZOON DE,** a Dutch naval officer; born in Flushing, Holland, March 24, 1607. From the situation of cabin boy he rose to the rank of captain in the Dutch navy in 1635, and rear-admiral in 1645. He defeated and sunk an Algerine pirate squadron in 1647. He distinguished himself in the war with England and in the service of Denmark. In 1667, sailing up the Thames he destroyed the English shipping and burned several men-of-war. His victories led to the peace of Breda. After fighting the French fleet in the Mediterranean, he retreated to the harbor of Syracuse, Sicily, where he died of his wounds, April 29, 1676.

RUZSKY, NICOLAS VLADIMIROVITCH, a Russian soldier, born about 1853. He was educated at a military academy in St. Petersburg, and when but 18 years of age served in the Turkish War in the Grenadier Guards. He was made a colonel at 31 and a major-general at 42. He served as chief of staff in the Second Manchurian Army during the Russo-Japanese War in 1904-1905. He afterward became a member of the Army Council and commanded an army corps. At the outbreak of the World War he commanded the Russian forces which won a great victory over four Austrian army corps near Lemberg, in September, 1914. In 1915 he commanded the Russian forces near Riga, and his exertions so undermined his health, that he died in the same year.

RYAN, JAMES, American Roman Catholic bishop, born, 1848, in Thurles co., Tipperary, Ireland. He was brought to the United States in childhood and was educated to the priesthood in the seminaries of St. Joseph, and St. Thomas. He was professor in St. Joseph's Seminary, and afterward served as pastor in several churches. He was consecrated bishop of Alton, Ill., in 1888.

RYAN, MARAH ELLIS, an American novelist, born in Butler co., Pennsylvania, in 1866. Her novels, chiefly of southern scenes, include "Told in the Hills" (1890); "The Bond-Woman" (1899); "Indian Love Letters" (1907); "The Woman of the Twilight" (1913); "The House of the Dawn" (1914); and "Treasure Trail" (1919).

RYAN, PATRICK JOHN, an American Roman Catholic prelate; born in Thurles, Ireland, Feb. 20, 1831. He was ordained deacon in 1853, completing his studies in St. Louis, Mo., and raised to the priesthood in 1854. In 1872 was

elected coadjutor archbishop of St. Louis. His administration was energetic and successful. He was promoted archbishop in 1883 and in 1884 transferred to the see of Philadelphia. He wrote: "What Catholics do not Believe," "The Causes of Modern Religious Skepticism." He died Feb. 11, 1911.

RYAN, THOMAS FORTUNE, an American financier. He was born in Nelson co., Va., in 1851, and after receiving his preliminary education began his business career in 1868 in a Baltimore dry goods house. He entered Wall Street in 1870 and became a member of the Stock Exchange in 1874. He afterward became interested in the consolidation and extension of street railway and lighting systems in New York, Chicago, and other cities, and in the reorganization of various railways in the South, coal properties in Ohio and West Virginia and railways in Ohio. He purchased the controlling interest in the stock of the Equitable Life Assurance Society of the United States and in 1908 retired as officer or director in more than 30 corporations in which he was controlling factor. He was a delegate from Virginia to the Democratic National Convention in 1904.

RYAZAN, a city and capital of a province of the same name in Central Russia, on the Trubesh, a tributary of the Oka, in the center of a rich agricultural district; has a large trade, more especially in rye. Manufactures include woolens, linens, needles, and leather. Pop. about 41,000. The government has an area of 16,254 square miles, and is wholly drained by the Oka and its tributaries. Cereals of all kinds are produced for export. The principal manufactures are cotton, linen, leather and spirits. Pop. about 2,700,000.

RYBINSK, or **RUBINSK,** a town in Russia, in the province of Jaroslav, on the Volga, at the confluence of the Rybinska. It is the center of the corn trade on the Volga, and commands an extensive commerce, being at the head of the canal and river system uniting the Baltic Sea with the Caspian. Pop. about 32,000.

RYE, a village of New York, in Westchester co. It is on the New York, New Haven and Hartford, and other railroads. Its excellent beach on Long Island Sound makes it a favorite summer resort. It is chiefly a residential place and has many fine residences, a seminary for girls, a public library, and a hospital. Pop. (1910) 3,964; (1920) 5,308.

RYE, *Secale cereale.* The glumes are one-nerved and shorter than the spikelet, the rachis is very tough; not known in a wild state. It is the prevailing grain cultivated in the S. of Sweden and Norway, in Denmark, Holland, the N. of Germany, and part of Siberia. It is cultivated to a small extent in England, and somewhat more extensively in America. It grows on poor, light soils unsuitable for wheat. The value of rye is about two-thirds that of wheat; its nutritious properties are to those of wheat as about 64 to 71. When formerly mixed with wheat it was called meslin. It is the chief grain from which Holland gin is distilled. When rye is attacked by ergot it is said to be spurred. In 1919 the United States produced 88,478,000 bushels on an area of 6,963,000 acres.

RYE GRASS, the genus *Lolium,* specifically, *L. perenne,* an excellent grass to mix with others for permanent pastures, or to be sown free from admixture as part of the rotation of crops. The variety *L. italica* is more valuable than the normal type.

RYE HOUSE PLOT, in English history, a conspiracy, planned in 1683, the immediate object of which was to assassinate Charles II. and his brother, the Duke of York (afterward James II.), as they returned from the Newmarket races. This plan was to have been executed on the road to London, near a farm called Rye House, belonging to one of the conspirators named Rumbold; but it was frustrated by the king and his brother happening to return from Newmarket earlier than was expected. The detection of the plot led to the arrest, on a charge of high treason, of Lords William Russell, Essex, and Algernon Sidney, who were in no way connected with it. Essex put an end to his own life in the Tower, while Russell and Sidney were beheaded, as also Lieutenant-Colonel Walcot, one of the real contrivers of the plot.

RYMER, or **RHYMER, THOMAS THE** (Thomas Lermont of Erceldoune), a Scotch poet of the 13th century, who occupies an important place in the mythical and legendary literature of Scotland. His name is associated with fragments of rhymed or alliterative verse, many of which have been collected and published as "The Prophecies" (1691); and "Sir Tristem: A Metrical Romance Edited by Sir Walter Scott from the Auchinleck MSS." (1804).

RYSWICK (rīs'wĭk; properly RIJSWIJK), a village and castle situated in South Holland, not far from The Hague, where the peace of Ryswick, which terminated the war waged against Louis XIV. by a league consisting of Holland, the German empire, Britain, and Spain, was signed, Sept. 21, 1697.

S

S, s, the 19th letter and the 15th consonant of the English alphabet. It represents a hissing sound and is classed as a sibilant. There are two sounds attached to this letter in English; the one surd, or uttered with breath merely, the other sonant or voiced. The first is a mere hissing sound, as in sin, so, etc.; the other is exactly the same as that of z, as in music, muse, etc. S in some words, as isle, island, viscount, is silent. It is closely allied to r, and even in the oldest English we have traces of the interchange, as in frore=froren=frosen (frozen), gecoren=chosen, etc. S has become st in hoist=hoise, whilst=whiles, etc. It has been changed into c, as in mice=Old English *mys*, once=Old English *ones*, hence=Old English *hennes*, etc. With a following h it forms a digraph, a weakening of an older and stronger sound sc, as shall=Old English *sceal*, fish=Old English *fisc*, etc. S is an exceedingly common letter in English. It is the characteristic sign of the genitive case and plurals of nouns.

S as an initial is used for South, as in S. W.=Southwest; for Society, as F. R. S.=Fellow of the Royal Society; for Saint, or double (SS.) for Saints. S as a symbol is used as a numeral for 7, and with a dash over it, for 70,000. Also in chemistry for the element sulphur.

SAALE, a river of Germany; distinguished from smaller rivers of the same name as the Saxon or Thuringian Saale, rises on the W. slope of the Fichtelgebirge (Bavaria), and flowing N. through several minor States, finally across Prussian Saxony, past the towns of Hof, Rudolstadt, Jena, Naumburg, Weissenfels, Merseburg, and Halle, falls into the Elbe, about 25 miles above Magdeburg, after a course of 226 miles. It is navigable from Naumburg to its confluence with the Elbe, a distance of 99 miles, for vessels up to 200 tons.

SAALFELD, a town in the former Duchy of Saxe-Meiningen, Germany, situated on the left bank of the Saale, 87 miles S. W. of Leipzig. Its importance is based on its manufacturing, its industries being principally knit goods, paints, and machinery. Pop. about 15,000.

SAARBRÜCK, or **SAARBRÜCKEN** (*French*, Sarrebruck), a town of Rhenish Prussia; on the Saar; 40 miles S. E. of Treves; the center of a large coalfield, and of iron and glass works, with manufactures of tobacco, chemicals, metal utensils, etc. Here, on Aug. 2, 1870, the first engagement took place between the French and Germans, the latter retreating. As a result of the Versailles Peace Treaty, the town came, at least temporarily, under French control. See SARRE BASIN. Pop. about 106,000.

SABA, a small island in the Leeward group of the West Indies, a little N. of St. Kitt's and near the island of St. Eustatia. Though a Dutch colony the Island of Saba is an independent republic. Pop. (1918) 2,229. The island rises abruptly from the sea, and is about 12 miles in circumference. On the S. side there is a break in the perpendicular rock-walls where a "ladder" of 1,000 steps and a gallery leads to the habitable part of the island. The natives raise cotton, fruit, and vegetables for export, and build boats of considerable size. A cabbage is the coat-of-arms of the republic. The Sabans are pure-blooded white people, descendants of Dutch, Swedish, and Danish pirates of the 17th and 18th centuries.

SABADILLA, CEBADILLA, or CEVADILLA, the name given in commerce to the pulverized seeds of two plants, the *Asagræa officinalis* of Lindley, and the *Veratrum Sabadilla*, both belonging to the natural order *Melanthaceæ*.

SABÆANS, the name of the ancient inhabitants of Yemen in southern Arabia. They are the people called Sheba in Gen. x. 28, xxv. 3; Job vi. 19; and other passages in the prophets; and it was

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A RUBBER TREE, TAPPED FOR GATHERING RUBBER, ISLAND OF TRINIDAD

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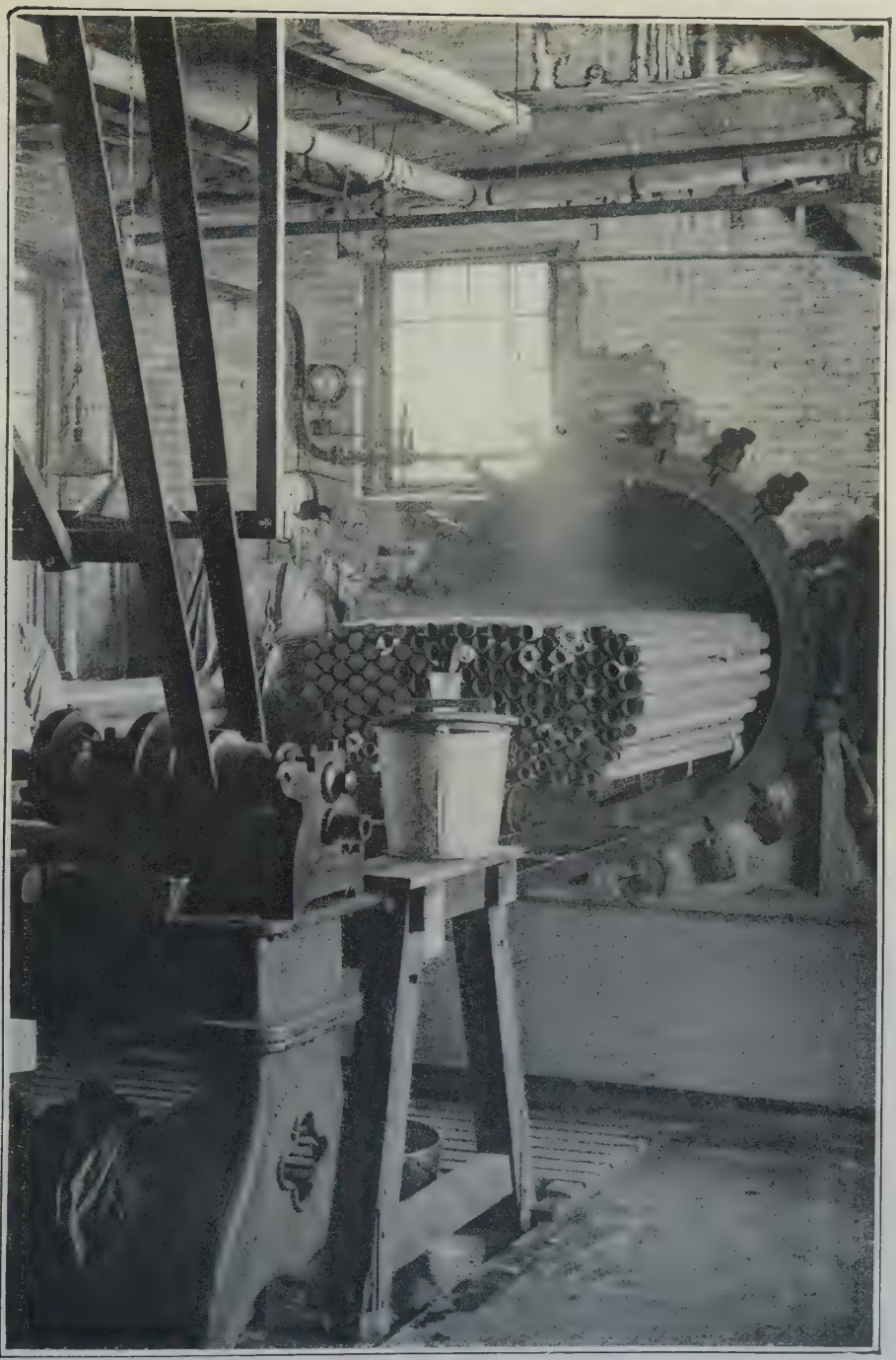
A RUBBER TREE IN CEYLON, SHOWING THE SPIRAL CUT USED IN TAPPING



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WRAPPING AND VULCANIZING RUBBER TIRES

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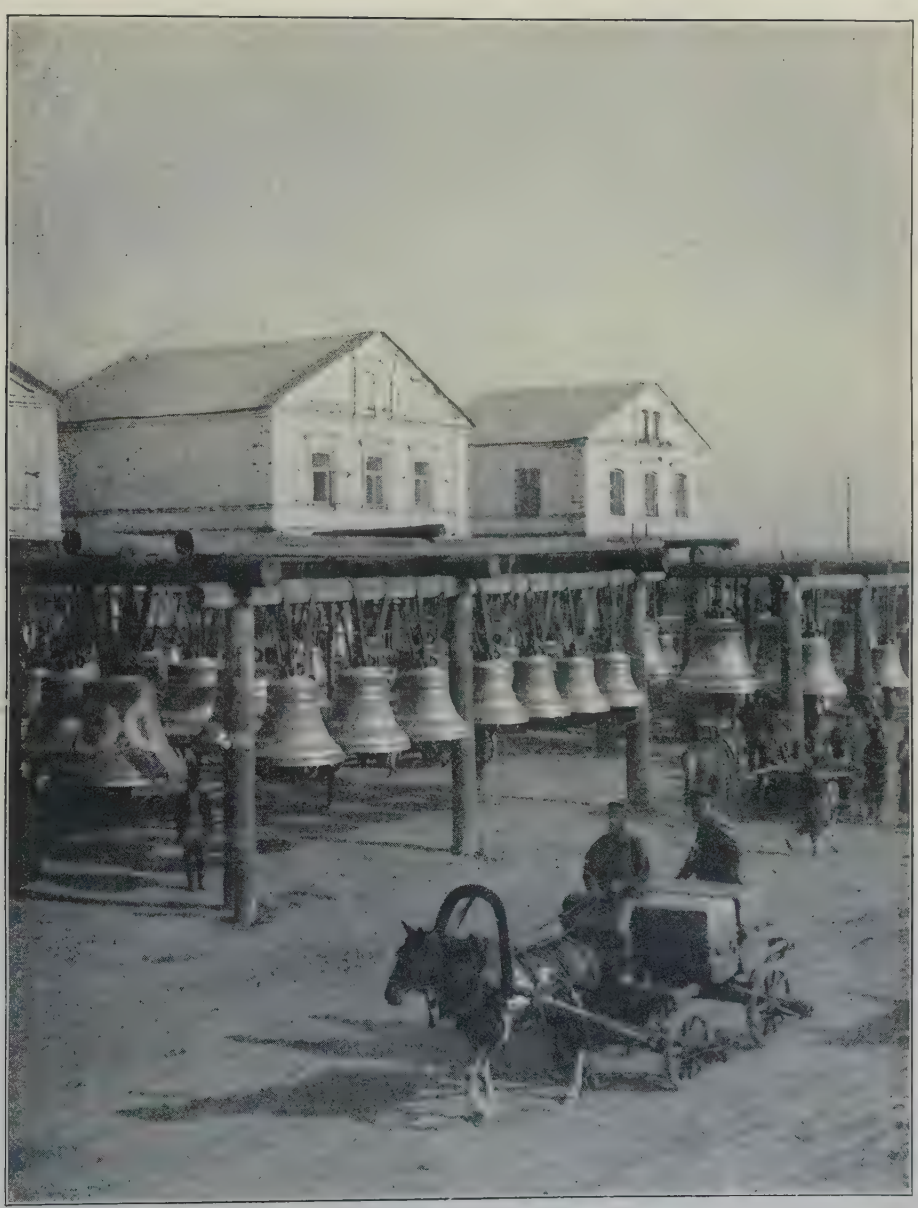
A VIEW IN THE CARPATHIAN MOUNTAINS, RUMANIA



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THE GREAT BELL MARKET AT THE NIZHNI NOVGOROD FAIR, RUSSIA

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TRINITY CHURCH IN THE KREMLIN, MOSCOW, RUSSIA

©Ewing Galloway

ST. LOUIS, MO., LOOKING UP OLIVE STREET. THE FIRST INTERSECTING STREET IS BROADWAY

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AIR VIEW OF SAN FRANCISCO, WITH THE CITY HALL IN THE FOREGROUND

probably the sovereign of this people who paid the celebrated visit to Solomon. The Sabæans were a powerful and wealthy people, who from long before the days of Solomon down to the beginning of the Christian era controlled the sea and caravan traffic in gold, sweet spices, ivory, ebony, and valuable tissues that came from India and Africa and were dispatched N. to Syria. To protect and watch over this trade they had stations or colonies in northern Arabia and in Ethiopia. The capital of their country was Mariaba (Marib), the ruins of which, including vast dams, lie N. E. of Sanaa. Their religion included the worship of the sun and moon, and a number of other deities. Their language is intermediate between Arabic and Ethiopian, but nearer akin to the former.

SABATIER, PAUL, a French writer. He was born at St. Michel de Chabrillanoux, in the Cevennes, in 1858, and was educated at the Faculté de Théologie, Paris, becoming in 1885 vicar of the St. Nicolas Church of Strasbourg. In 1885 he published the Greek text of the Didachè, but it was his "Vie de St. François" which made his name well-known, and the work was translated into several languages. After that appeared: "Collection d'études et des documents sur l'histoire litteraire et religieuse du moyen age"; "Speculum Perfectionis seu sancti Francisci Assisiensis Legenda Antiquissima, auctore fr. Leone"; "Modernism."

SABBATARIAN, in the 16th century, a sect who considered that the Christian Sabbath should be kept on the seventh day (Saturday). In modern times the word means one who holds that the Lord's day is to be observed among the Christians in exactly the same manner as the Jews were enjoined to keep the Sabbath; one who holds rigid views of Sabbath observance.

SABBATH, a sacred day of rest (the word being derived from *shabath*, Hebrew, to rest), the institution of which is first mentioned in Gen. ii. 2-3:

> "And on the seventh day God finished his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day and hallowed it; because that in it he rested from all his work which God had created and made."—"Revised Version."

The prevailing interpretation of these verses is that the Sabbath was instituted at the creation for mankind in general, and that septenary institutions may therefore be expected in all nations. Prior to the giving of the law from Mount Sinai, the Sabbath is mentioned in connection with the descent of manna (Exod. xvi. 5, 22-30). The keeping holy of the Sabbath is enjoined in the fourth commandment in Exodus, because of God's having rested after the creation (Exod. xx. 8-11); in Deuteronomy because of the deliverance of the Hebrew bondsmen from Egypt (Deut. v. 12-15). Two lambs instead of one were offered when it came (Num. xxviii. 3-4, 9). Isaiah (lvi. 2, lviii. 13) strongly advocated its observance.

Always in the Gospels, and, as a rule, in the other books, Sabbath means the seventh day of the week. By this time its observance had become very rigid and punctilious, and Jesus Himself was constantly denounced by the Pharisees and others as a Sabbath-breaker (Matt. xii. 1-2; Mark iii. 2-3). In self-defense he laid down this principle: "The Sabbath was made for man, and not man for the Sabbath; therefore the Son of Man is Lord also of the Sabbath" (Matt. xii. 8, with Mark ii. 28).

For the first three centuries of Church history, the Christian fathers in general drew a distinction between the Sabbath and the Sunday or Lord's day, regarding the former as Jewish and obsolete, and the latter as a divinely instituted day, joyous in its character as commemorating Christ's resurrection. But from the days of the first and ambiguous edict of Constantine on the subject:

> "Let all judges, inhabitants of the cities, and artificers, rest on the venerable Sunday [dies solis]. But husbandmen may freely and at their pleasure apply to the business of agriculture,"

there was an increasing tendency to transfer to the Sunday, and, in a less degree, to saints' days and minor festivals the restrictions of the Jewish Sabbath. The third Council of Orleans (A. D. 538) strove to check this tendency, but in the same century we find legends of miraculous judgments on those who worked on the Sunday. The idea of the "Christian Sabbath" seems to be enunciated for the first time in Alcuin. The Reformers generally were opposed to Sabbatarian views, which, however, more or less modified, found a place in Protestant churches generally, and reached their height in the Puritan period.

SABBATICAL YEAR, in Judaism, the name given to every seventh year, during which the Hebrews were not to sow their fields or prune their vineyards (Exod. xxiii. 10, 11; Lev. xxv. 2-7; Deut. xv. 1-11; xxxi. 10-13).

SABELLIANISM, in Church history, the name given to any form of doctrine which denies a real distinction between the Persons of the Trinity; the same as

Patripassianism. Also the doctrine of the adherents of Sabellius (an African presbyter of the 3rd century), if not of Sabellius himself. It resolved the doctrine of the Trinity into three manifestations of God to man, and taught that the same Person was the Holy Ghost when manifesting himself to the Christian Church, and, by parity of reasoning, the Son, when he appeared in Christ. Thus Patripassianism was avoided, but the Incarnation, as well as the Trinity, was denied, for the manifestation of God in Christ could differ only in degree, not in kind, from his union with other holy men. Akin to this teaching was that of Marcellus (Bishop of Ancyra in the early part of the 4th century), who made the Logos a mere attribute of God, manifesting itself in the creation, the Incarnation, and the sanctification of Christians.

SABER, or **SABRE**, a sword having a curved blade, specially adapted for cutting.

SABIANISM, SABÆANISM, or **TSABAISM**, a faith which recognized the unity of God, but worshiped angels or intelligences supposed to reside in the stars and guide their motions, whence the lapse, at least on the part of the common people, to the worship of the stars became easy. They had sacrifices and sacred days, and believed in a future state of retribution. They were once numerous in Arabia, Syria, and Mesopotamia, and their sacred books were in Syriac. The early Mohammedans did not rank them with polytheists.

SABICU, or **SAVICU**, a leguminous tree, *Lysiloma Sabicu*, native of Cuba. It furnishes an exceedingly heavy and hard wood, with a texture as smooth, close, and firm as ivory almost, and of a rich, warm, red color. It is much employed for shipbuilding and cabinet making.

SABINE, a river of the United States, forming the boundary between Louisiana and Texas. It rises in northeastern Texas, and after a course of some 500 miles flows into the Gulf of Mexico through Sabine Bay. It is too shallow to be of much use for navigation.

SABINE CROSSROADS, a place in De Soto parish, La., about 4 miles S. of Mansfield, where, in the Civil War, the Confederate troops under command of Generals E. Kirby Smith, Taylor, Moulton, and Green, defeated the Federal troops under command of Generals Lee, Franklin, Banks, and Ransom. The Union forces lost 10 guns and about 7,000 of their men were taken prisoners.

SABINE LAKE, a body of water formed by an expansion of the Sabine river, on the boundary of Louisiana and Texas, about 5 miles N. of the Gulf of Mexico. It is about 18 miles long, averages about 9 miles in breadth, and has an area of about 150 square miles.

SABINE MOUNTAINS, a range that is a branch of the Apennines, near the border of ancient Latium, E. of Rome. Its highest point is about 4,200 feet.

SABINES (sā'bīnz), an ancient people of Italy, supposed to have been named from "Sabus," one of their deities. Little is known of their history. They were at war with the Romans at a very early period. A contest broke out between them 504 B. C., and a body of the Sabines migrated to Rome, where they were welcomed, and founded the powerful family and tribe of Claudii. The Sabines carried their ravages to the very gates of Rome, 469 B. C. On their defeat by Marcus Horatius, 449 B. C., their camp was found full of plunder obtained in the Roman territories. They were again at war with the Romans, 290 B. C., and having been vanquished, many of them were sold as slaves. The remaining citizens were admitted to the Roman franchise.

SABLE, the *Mustela zibellina*, a digitigrade carnivorous mammal, nearly allied to the common marten and pine marten, found chiefly in Siberia and Kamtchatka, and hunted for its fur. Its length, exclusive of the tail, is about 18 inches. Its fur, which is extremely lustrous, and

SABLE

hence of the very highest value, is generally brown, grayish-yellow on the throat, and with small grayish-yellow spots scattered on the sides of the neck. It is densest during winter. Two other species of sable are enumerated, the Japanese sable (*M. melanopus*) and a North American species (*M. leucopus*). The Tartar sable (*M. siberica*) is the name given to a species of the weasel genus found in northern Russia and Siberia, and the pekan (*M. canadensis* or *M. pennantii*) of North America is some-

times known as the Hudson Bay sable. Sable hair is used in the manufacture of artists' pencils.

SABLE, in heraldry, black, one of the tinctures used in blazonry. In engraving it is expressed by perpendicular crossed by horizontal lines.

SABLE ISLAND, a low-lying island in the Atlantic; in lat. 44° N. and lon. 60° W.; 110 miles E. of the central part of Nova Scotia (and not near Cape Sable, at the S. E. corner of Nova Scotia, where there is also a Sable Island). It consists of two parallel sand ridges, with a lagoon between them. Scrubby grass, cranberries, etc., grow on the island, which is so dangerous to navigation, and has so frequently been the scene of wrecks, as to be called "the sailor's grave." The Canadian Government maintains two lighthouses here. The island is gradually sinking. Early in the 19th century it was 40 miles long; it is now reduced to 20 miles. Near it there are sandbanks.

SABLES D'OLONNE, LES, a seaport of France; department of Vendée; on the Atlantic coast, 50 miles S. by W. of Nantes. It owes its early importance to Louis XI., who excavated (1472) the port and erected the fortifications. There is a trade in grain, wine, salt, cattle, timber, and tar. Salt making, shipbuilding, and fishing (sardines and oysters) are the chief occupations. The town is visited for its sea-bathing. Pop. about 15,000.

SABOT (sab'o), a wooden shoe made of one piece hollowed out by boring tools and scrapers. The kinds of woods used are willow, poplar (Lombardy), beech, birch, aspen, ash, hornbeam, walnut. Sabots are worn by the peasants of France, Belgium, etc.

SABOTAGE, an expression which is believed to have had its origin in the practice, in France, during the early period of industry, whereby the weavers inserted a wooden shoe, or sabot, in the machinery to destroy it. From its common usage among French workers, the term has acquired a broader and an international significance among organized workers. It signifies a systematic impeding of the wheels of industry by destruction or disabling of machinery, for definite tactical aims. Emery dust is thrown into complicated machinery, tools are dulled, material is destroyed, all for the purpose of bringing the employer to terms in a labor dispute. Another method with the same aim is the obeying of rules to the letter, as in the railroad industry, causing delay in traffic. Systematic slackening of effort in the workshops is also another practice which comes under the term of sabotage.

As a substitute for the strike as a means to bringing the employer to terms, sabotage was at one time generally recognized among the radical labor elements as a legitimate weapon to attaining their ends. Within recent years, however, there has been a decided reaction against this form of "direct action." In 1912 the Socialist Party of the United States definitely declared itself, at a national convention, against all forms of direct action, including sabotage. It is still regarded as a legitimate weapon by the Industrial Workers of the World, who, on the other hand, consider political action futile as a method by which to achieve benefits for the working classes.

SABOTIÈRE, a French apparatus for making ices. It differs little from the common American ice-cream freezer. The space between the wooden pail and metal container is filled with pounded ice and salt, or sulphate of soda and hydrochloric acid.

SACBUT, or **SACKBUT**, a musical instrument of the trumpet kind with a slide; in fact an old variety of TROMBONE (*q. v.*). The instrument called *sabbeka* in the Hebrew Scriptures has been erroneously rendered as sacbut by the translators. The exact form of the sabeka has been much disputed, but that it was a stringed instrument is certain, for the name passed over into Greek and Latin in the forms *sambuke, sambuca,* a harp-like instrument of four or more strings.

SACCHARIN, in chemistry,

$$C_7H_5NO_3S = C_6H_4 \begin{cases} CO \\ SO_2 \end{cases} > NH;$$

a sweet substance which was discovered by Fahlberg and Remsen in 1879, and named by them anhydro-orthosulphaminebenzoic acid. It may be prepared by oxidizing orthotoluene with potassium permanganate. It forms white crystals, soluble in hot water, alcohol, and ether, and melts at 220° with partial decomposition. Its sweetness exceeds that of cane sugar about 500 times. When taken into the system it passes through unchanged. It is used to disguise the taste of medicines and in cases of diabetes where sugar is prohibited. It was used extensively in place of sugar during the World War.

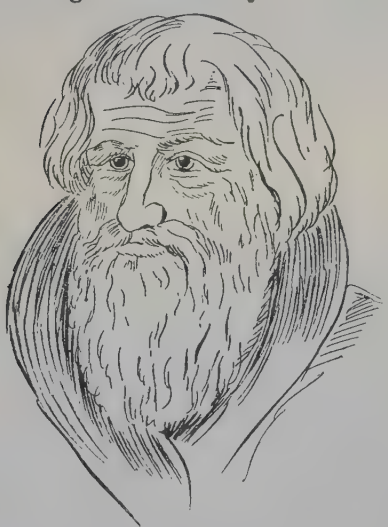
SACCHARUM, sugar cane; a genus of grasses, tribe Andropogoneæ; inflorescence in loose panicles, with lanceolate spikelets; glumes two-valved, two flowered, enveloped in long wool; lower neuter with one pale, upper hermaphrodite with two; mostly tropical or sub-tropical; known species about 32. *S. officinarum* is the common sugar-cane. Other Indian species—*S. fuscum, S. mara, S. munja, S. semidecumbens, S. canaliculatum,* and

S. spontaneum—have fibers used in the manufacture of ropes, strings, mats, and paper. The leaves and seeds are employed for thatch, and the culms of some for native pens.

In chemistry, a term formerly synonymous with sugar, but now used almost exclusively to denote an invert sugar prepared from cane sugar by the action of acids. It is largely used by brewers.

SACHEVERELL (sa-shev'ur-el), **HENRY**, an English clergyman; born in Marlborough, England, in 1674. While preacher at St. Saviour's, Southwark, he in 1709 delivered two bitter sermons against dissent and accused the existing Whig ministry of jeopardizing the safety of the Church. He was impeached in the House of Commons, tried in the spring of 1710, and suspended for three years. This persecution secured him at once the character of a martyr, and helped to stimulate the already fierce passions which then divided the Whig and Tory party. Sacheverell became the popular hero of the hour; while the Godolphin (Whig) ministry was overthrown. Parliament thanked him for his defense of the Church, and as soon as his suspension expired, Queen Anne presented him with the rich living of St. Andrew's, Holborn. Sacheverell, having no merit to keep him permanently before the public, now fell back into obscurity. He died in London, June 5, 1724.

SACHS, HANS, the most distinguished meistersinger of Germany in the 16th



HANS SACHS

century, born in Nuremberg, Germany, Nov. 5, 1494. He learned the trade of a shoemaker, commenced business in his native city, married (1519), and prospered. He took lessons under one of the chief meistersingers of Nuremberg, and soon surpassed all his contemporaries. As a staunch follower of Luther, and an ardent advocate of his teachings, Sachs succeeded in imparting to his hymns a fervor which considerably aided the spread of the Reformation. A bronze statue in his memory was erected in 1874 at Nuremberg, where his house may still be seen. He died in Nuremberg, Jan. 19, 1576.

SACK (Spanish, *seco;* French, *sec,* "dry"), formerly a general name for the different sorts of dry wines, more especially the Spanish, which were first extensively used in England in the 16th century. Also a measure or weight, varying according to the article and country. Also a term applied to the plundering of a town or city.

SACKVILLE, THOMAS, Lord Buckhurst and Earl of Dorset, an English statesman; born in Buckhurst, England, 1536. At Oxford and Cambridge he distinguished himself by his Latin and English poetry, and as a student of the Inner Temple he wrote, in conjunction with Thomas Norton, the tragedy of "Gorboduc," or "Ferrex and Porrex" (published in 1561), remarkable as the first example in English of regular tragedy in blank verse. The "Mirror of Magistrates," and the "Complaint of Henry, Duke of Buckingham," contain fine passages. He took a prominent and creditable part in some of the chief events of Elizabeth's reign. He was a member of the court which tried Mary Queen of Scots; he succeeded Lord Burleigh as lord high treasurer; and presided at the trial of the Earl of Essex. From 1587-1588 he suffered imprisonment at the instigation of the queen's favorite Leicester. In 1566 he had succeeded to his father's ample estate; was raised to the peerage as Baron Buckhurst shortly afterward; and James I. created him Earl of Dorset in 1604. He died in London, April 19, 1608, and was buried in Westminster Abbey.

SACKVILLE-WEST, SIR LIONEL SACKVILLE, an English diplomatist; born July 19, 1827; was British minister to the United States in 1881-1888. He received his passports in the latter year from President Cleveland for having written a letter during the presidential campaign in which he advised a vote for the Democratic ticket as conducing to British interests, in answer to a correspondent who represented himself to be a naturalized English citizen desiring political advice. He died Sept. 3, 1908.

SACO, a city in York co., Me.; on the Saco river, and on the Boston and Maine railroad; 4 miles from the ocean; and 14 miles W. S. W. of Portland. It is connected with Biddeford on the W. side of the river by bridges. Here are York institute, Thornton Academy, Dyer Library, Wardwell Home for Old Ladies, street railroads, electric lights, and National and savings banks. The city has manufactories of harness, belting, brushes, boots and shoes, lumber, cotton goods, cotton machinery, etc. Pop. (1910) 3,583; (1920) 6,817.

SACO, a river in the United States. It rises in New Hampshire, in the White Mountains, and runs S. E. into the Atlantic below Saco, Me. It is 160 miles long, and has falls of 72 feet at Hiram, of 42 feet at Saco, and numerous minor ones.

SACRAMENT, the military oath taken by every Roman soldier, pledging him to obey his commander and not to desert his standard; hence, an oath or ceremony involving an obligation.

In Protestant theology the Church of England and the Protestant Episcopal Church in the United States define a sacrament as "an outward and visible sign of an inward and spiritual grace given unto us, ordained by Christ Himself, as a means whereby we receive the same and a pledge to assure us thereof." They recognize two only as generally necessary to salvation, Baptism and the Supper of the Lord. Article xxv. says that they were ordained by Christ not only to be badges or tokens of Christian men's profession, but also, or rather, to be sure signs of grace and God's good will toward us, by which He strengthens our faith in Him. They have a wholesome effect or operation only to those who worthily receive them; unworthy recipients purchase to themselves damnation (I Cor. xi. 29. The Revised Version has "judgment.") The Westminster Confession of Faith teaches essentially the same doctrine. It considers sacraments to be "holy signs and seals of the covenant of grace" (ch. xxvii.). Other Protestant formulas are substantially the same.

In Roman theology, a visible sign, instituted by Christ, which confers *ex opere operato* (by the performance of the act) sanctifying grace on man. Matter, form and a minister acting with the intention of doing what the Church does are necessary to the valid administration of a sacrament. Besides sanctifying grace, sacraments confer sacramental grace—that is, they aid the suscipient in a special manner to attain the end for which each sacrament was instituted. The Council of Trent (sess. vii., can. 1) defines that the Sacraments of the New Law were instituted by our Lord, and are neither more nor fewer than seven in number: Baptism, confirmation, eucharist, penance, extreme unction, holy orders, and matrimony. The first five are necessary for all Christians, the last two are necessary only for the community. Baptism, confirmation, and orders imprint a character on their subject and cannot be repeated without sacrilege. The term sacraments of the old law has been adopted to signify circumcision, the paschal lamb, the ordination of priests and Levites, etc., of the Mosaic economy.

SACRAMENTAL, in Roman theology, a name given to rites which bear some outward resemblance to the sacraments, but which are not of divine institution. They are: the prayers of the Church, especially the Lord's prayer; holy water, blessed ashes, palms and candles, blessed bread; the general confession in the mass and office; alms-giving, and the blessing of bishops and abbots. The prayers, however, must be offered in a consecrated place, and the alms given in the name of the Church. See SACRAMENT.

SACRAMENTARIANS, a term used in several senses. (1) Ordinarily in England it means one who holds a "high" or extreme doctrine of the efficacy of the sacraments, especially of the Eucharist. (2) Technically, however, the word is used in Church history in an almost diametrically opposite sense for persons holding a "low" doctrine on the subject of the sacraments—for the party among the Reformers who separated from Luther on the doctrine of the Eucharist. Luther taught the doctrine of the real presence of the body and blood of Christ along with the bread and wine. Carlstadt, Capito, and Bucer were the leaders of those who called this doctrine in question. This sacramentarian party became so considerable that in the diet of Augsburg they claimed to present a special confession known in history by the name of the Tetrapolitan Confession—so called from the four cities, Strasburg, Constance, Lindau, and Memmingen. The Tetrapolitan Confession rejects the doctrine of a corporeal presence, and though it admits a spiritual presence of Christ which the devout soul can feel and enjoy, it excludes all idea of a physical presence of Christ's body. Simultaneously with this German movement, yet independent of it, was that of the Swiss reformer Zwingli, whose doctrine on the Eucharist was identical with that of Carlstadt, and who himself presented a private confession of faith to the Augsburg diet in which this doctrine is embodied. The four cities named above

continued for many years to adhere to this confession presented to the diet of Augsburg in their name; but eventually they accepted the so-called Confession of Augsburg, and were merged in the general body of Lutherans. On the contrary, the article of Zwingli upon the Eucharist was in substance embodied in the confession of the Helvétic Church.

SACRAMENTO, a city, capital of the State of California, and county-seat of Sacramento co.; at the confluence of the Sacramento and American rivers, at the head of low water navigation, 96 miles N. E. of San Francisco. It is built on a broad, low plain and has strong levees as a protection against floods. It has a semi-tropical climate, and vegetation is most luxuriant. The city has about 200 manufacturing establishments, and the combined annual output exceeds $75,000,000 in value. There is a large variety of industries, the most important including the manufacture of agricultural implements, carriages and wagons, pottery, woolen goods, machinery, furniture, etc. Here are also the Southern Pacific railroad shops which cover 25 acres of ground and employ about 4,000 men. The convenient location of Sacramento in the center of a rich agricultural region gives it a large trade with the interior of the State. There are a number of National and State banks, and numerous daily and weekly periodicals. The assessed property valuation is nearly $136,400,000.

Public Interests.—The streets are well laid out, and mostly lighted by electricity. The State capitol, which stands in a beautiful plaza covering 30 acres, was finished in 1869 at a cost of about $2,500,000. Within the plaza are the State Printing office and the Exposition Building of the State Agricultural Society. In the latter the resources of the State are annually exhibited. There are over 1,000 acres of parks, and 98 miles of paved streets. The thirteen banks in 1920 had deposits of $66,000,000. The clearings in 1919 were for $300,000,000. There are thirty-six school buildings, with an enrollment of over 13,000 pupils. The other noteworthy buildings include the court house, United States Government building, city hall, Hall of Justice, Agricultural Pavilion, City Library, Crocker Art Gallery, the California State bank, Fort Sutter (rebuilt), the Sacramento Institute, Christian Brothers' College, California State Library, Mater Misericordia and Southern Pacific Railroad Hospitals, Children's Day Home, and many charitable homes.

History.—Capt. John A. Sutter built a fort here in 1839, but the city was not settled till 1848, after the discovery of gold. The first house was built in 1849. Sacramento was made the State capital in 1854, and received its city charter in 1863. It has suffered severely twice from fire and twice from inundation. Pop. (1910) 44,696; (1920) 65,908.

SACRAMENTO, a river of the United States, in California. It rises in Lassen co., flows W. then S. and drains the central valley of California from the N. Its course is about 500 miles, 320 of which are navigable for small vessels. It discharges its waters into the Suisun Bay, on the line between Contra Costa and Solono counties.

SACRED HEART, in the Roman Church, the physical heart of Christ, considered, not as mere flesh, but as united to the divinity. It is the object of a special devotion, founded in the latter part of the 17th century by a French nun of the Order of the Visitation, Sister Margaret Mary Alacoque (beatified in 1864), and first preached in England by Father de la Colombière, S. J., chaplain to Mary of Modena, queen of James II. The feast of the Sacred Heart is celebrated on the Friday (in England on the Sunday) after the octave of Corpus Christi.

SACRED HEART, LEAGUE OF THE, or Apostleship of Prayer in League With the Sacred Heart of Jesus, a confraternity of the Catholic faithful, founded at Vals, in France, 1844, by Father Gautrelet, S. J., with the intention of promoting an apostolic spirit among the young Jesuit students located there. The association, with its motto "Thy Kingdom Come," attracted the pious and soon spread throughout the Catholic world. Father Ramière, S. J., added to the progress of the confraternity by the establishment of the "Messenger of the Sacred Heart of Jesus," which became, in various languages, the monthly organ. Names of members are kept on record and number over 25,000,000 while local centers are around 63,000. There are over 5,000,000 members in the United States.

SACRED WAR, a war about sacred places or about religion. Four sacred wars were waged in Greece (595-338 B. C.) chiefly for the defense of the temple of Delphi and the sacred territory surrounding it. A Mohammedan war for the faith is called a Jihad. The Crusades and the wars of the Reformation were sacred wars. The quarrel which led to the Crimean War was at first a dispute between Russia and France about sacred spots at Jerusalem.

SACRIFICE, the offering of anything to God or to any deity. Also that which is sacrificed, offered, or consecrated to

God or to any deity or divinity; an immolated victim, or an offering of any kind, laid on an altar or otherwise religiously presented by way of thanksgiving, atonement, or conciliation.

Sacrifices form an important part of all early forms of religion. Tylor traces three stages in the development of the rite: (1) The gift theory, in which the deity takes and values the offering for himself. (2) The homage theory, in which the submission or gratitude of the offerer is expressed by a gift. (3) The abnegation theory, in which the worshiper deprives himself of something prized. With regard to their nature, sacrifices are divided into (1) Bloody [(*a*) human; (*b*) of the lower animals], and (2) Unbloody. The terrible custom of offering human sacrifices was very widely spread. It was known among the Greeks and the Romans; and is frequently mentioned in Scripture.

As civilization advanced, human victims were replaced by symbols, or oxen or sheep were offered in their stead. Unbloody sacrifices consisted of libations, incense, fruit, and cakes (often in the form of, and as substitutes for, real animals). It is noteworthy that though the first sacrifice mentioned in the Old Testament (Gen. iv. 3) belonged to this category, the first sacrifice accepted (Gen. iv. 4) was a bloody one.

In the Old Testament sacrifices were of two kinds, bloody and unbloody. Those designed to atone for sin were of the former kind (Lev. i. 7; Heb. ix. 22). The idea of sacrifice first appears in Gen. iv. 3-5, and viii. 20, but the English word sacrifice does not occur in the Authorized Version till xxxi. 54. The paschal lamb is called a sacrifice (Exod. xxxiv. 25; Deut. xvi. 2). Even from patriarchal times sacrifices were limited to clean beasts and birds, and were offered on an altar (Gen. viii. 20). Many of these sacrifices were made by fire. A certain portion of the slain animal was reserved for the priest (Deut. xviii. 3). Under the law there were morning and evening sacrifices (I Kings xviii. 29; Ezra ix. 4, 5, Dan. viii. 11, 12, 13; xii. 11), besides weekly sacrifices on the Sabbath, sacrifices at new moons, annual ones, etc. Not merely were there stated sacrifices for the people at large, arrangements were at times made that private families also should possess the boon (I Sam. xx. 6, 29). Under the monarchy sacrifices were confined to the temple at Jerusalem (II Chron. vii. 12). Thanksgiving was called a sacrifice (Lev. vii. 12, 13; Psalm cvii. 22; cxvi. 17; Jonah ii. 9), so was praise (Jer. xxxiii. 11).

In the New Testament, Abel's offering is now called a sacrifice, and its excellence is made to arise from the faith with which it was offered (Heb. xi. 4).

In theology, the evangelical doctrine is that the sacrifices of the older economy were types and shadows of the atoning sacrifice made by Christ. It is held that when Jesus died, His sacrifice once for all satisfied Divine justice, and no other was requisite, or would, if offered, be accepted (Heb. ix. 12, 25-28, x. 10, 12, 14).

SACRILEGE, in a general sense, the violation or profaning of sacred things; more strictly the alienating to laymen, or common purposes, what was given to religious persons and pious uses. Church robbery, or the taking things out of a holy place is sacrilege, and by the common law was punished with more severity than other thefts, but it is now put by statute on the same footing with burglary or housebreaking.

SACRISTAN, the same as sexton, which is a corrupted form of the same word; an officer in a church whose duty it is to take care of the church, the sacred vestments, utensils, etc.

SACRISTY, the apartment in or connected with a church intended for the keeping of the sacred vestments and utensils while not in use, and in which also the clergy and others who take part in religious ceremonies array themselves for service.

SACRUM, in anatomy, the bony structure which forms the basis or inferior extremity of the vertebral column.

SADDLE, a kind of seat for a horse's back, contrived for the safety and comfort of the rider. The modern riding saddle consists of the tree, generally of beech, the seat, the skirts, and the flaps, of tanned pig's-skin. Among the varieties are racing saddles, military saddles, hunting saddles, and side saddles for ladies. The name saddle is also given to a part of the harness of an animal yoked to a vehicle, being generally a padded structure by means of which the shafts are directly or indirectly supported.

SADDLEBACK, a mountain in Cumberland, England, 5 miles N. E. of Keswick; height, 2,847 feet.

SADDLEBACK MOUNTAIN, a mountain in Franklin co., Me.; reaches a height of 4,000 feet.

SADDUCEES, one of the three Jewish sects. The current tradition, which was first published by Rabbi Nathan in the 2d century, is that the Sadducees derived their name from a certain Zadok, a disciple of Antigonus of Soko (200-170 B. C.). The Zadok from whom they derive their

name was the priest who declared in favor of Solomon when the High Priest Abiathar adhered to Adonijah (I Kings i. 32-45). His descendants had a subsequent pre-eminence (Ezek. xl. 46, xliii. 19, xliv. 15, xlviii. 11). Not that the Sadducees became a party so early, or that Zadok was their founder; but that some of them may have been his descendants, and all admired his fidelity to the theocratic government, even when the head of the priesthood had gone astray. It was their desire to be equally faithful. All the Jews admitted that the Mosaic law was given at Sinai by Jehovah Himself. Most of the people, with the concurrence and support of the Pharisees, believed that an oral law of Moses had similarly come from God. The Sadducees rejected this view, and would accept nothing beyond the written word. They were the Protestants of the older economy. Certain consequences followed. In the Mosaic law there is no reference to a state of rewards and punishments in a future world. When Jesus proves the resurrection from the Pentateuch, He does so by an inference, there being no direct passage which He can quote (Matt. xxii. 31, 32). The Sadducees therefore denied the resurrection from the dead (verse 23). The doctrine of a future world is taught in some passages of the Old Testament, especially in Dan. xii. 2, 3, etc., which should have modified their belief. That it did not do so can be explained only by supposing that they attributed a higher inspiration to the Mosaic law than to other parts of the Old Testament. Epiphanius (Hœres., xiv.) and some other of the fathers assert that the Sadducees rejected all the Old Testament but the Pentateuch. Probably, however, these writers confounded the Sadducees with the Samaritans. In Acts xxiii. 8, it is stated that they say that "there is neither angel nor spirit." How they could ignore all the angelic appearances in the Pentateuch (Gen. xvi. 7, 11, xix. 1, etc.) is hard to understand. Perhaps they may have believed that, though angelic appearances once took place, they had now ceased. It is surprising that a sect with these views should, at least at one time, have almost monopolized the highest places in the priesthood; yet such was the case, at least temporarily (Acts iv. 1-6). But, with all their sacred office and worldly rank, they could have had no hold on the common people. It is probable that, when Christianity spread—even among its Jewish opponents—a belief in the resurrection, the Sadducees must have still further lost ground; but they ultimately revived, and still exist, under the name of KARAITES (*q. v.*).

SADI, or SAADI, the most celebrated didactic poet of Persia; born in Shiraz, Persia, about the end of the 12th century. In his youth he visited Hindustan, Syria, Palestine, Abyssinia, and made several pilgrimages to Mecca and Medina. While in Syria he was taken by the Crusaders, and forced to labor on the fortifications of Tripoli. After about 50 years of wandering he returned to his native city. The best of his works are: "Gulistan" (Garden of Roses), a moral work, comprising stories, anecdotes, and observations and reflections in prose and verse; and "Bostān" (the Orchard), of much the same character. He died about the end of the 13th century.

SADOWA. See KÖNIGGRÄTZ.

SAENZ, PEÑA ROQUE, an Argentine statesman, born at Buenos Ayres, in 1851. He studied law in the University of Buenos Ayres, and in 1876 was elected to the Chamber of Deputies, becoming in the course of a year president of the Chamber. When the war with Peru broke out in 1879 he joined the army and was wounded and taken prisoner. Returning to his native city in 1881 he became Under-Secretary for Foreign Affairs. Meanwhile he had entered journalism and founded the review "Sud America." He became minister to Uraguay and served as ambassador to Spain in 1906, and to Italy 1907-10. In 1910 he was elected president of the republic and as such promoted the A. B. C. (Argentine, Brazil, Chile) entente. He died in 1914.

SAFE, a receptacle for valuables, of iron or steel, or both combined. A safe to answer all requirements should be fire, explosive, acid, drill, and wedge proof. A fireproof safe need only be so constructed that, though exposed to the intense heat of a conflagration, its inner recesses remain at a sufficiently low temperature to prevent combustion of the contents. A burglar-proof safe needs many other safeguards, and the history of safe-making is mainly a record of struggles between the safe manufacturer and the burglar; the result is that safes can now be obtained which are all but impregnable. The safe consists of an outer and an inner wall, the space between being filled with some fire-proof material such as asbestos, silicate cotton, gypsum, etc. The outside casting, which may be single or compound, naturally receives the greatest attention, and various are the devices of manufacturers to render it sufficiently hard and solid to resist the finely tempered drills of the burglar. To prevent wrenching, the door is secured by bolts moving straight or diagonally into slots

on one or on all sides. These bolts are moved by the door handle, and the lock key fixes them in their positions.

The first great improvements in locks, as applied to safes, are due to Chubb of London; but numerous patents, mostly of American origin, have been introduced. Of these the keyless permutation locks deserve particular mention, as they obviate the danger which arises from lost or false keys. Such locks allow of opening only after an indicator has been moved in accordance with a certain combination of numbers arranged before closing the safe. Some safe locks are so constructed that to be freed they require different keys on different days, some can only be opened at a certain hour, this being fixed on before the door is closed; while others again require two or more keys in charge of different persons; in fact, the arrangements contrived to render the plundering of safes next to impossible are too numerous even to mention. The connection of safes with electric alarms in a variety of ways forms another safeguard.

SAFED, one of the four holy cities of the modern Jews in Palestine; in horseshoe shape round a hill 2,700 feet above the Mediterranean; 6 miles N. W. of the Sea of Galilee. Here dwell about 15,000 Jews, Moslems, and Christians. The town was overthrown by earthquakes in 1759 and 1837. A castle of the Christians, built during the Crusades, was destroyed by the Sultan of Damascus in 1220, and, having been rebuilt by the Templars, was again taken and destroyed by Beybars of Egypt in 1266. The Jewish colony has been settled here since the 16th century, and embraces many immigrants from Poland.

SAFED KOH (White Mountains), a mountain range in Afghanistan. The W. portion of the chain separates the Herat river valley from the Murghab, while the E. Safed Koh forms the S. boundary of the Kabul basin. These mountains are quite alpine in their character, and some of the peaks exceed 15,000 feet in height. Among the spurs of the E. section are the passes leading from Kabul to Jalalabad, and from Jalalabad to Peshawur famous in the annals of British military expeditions into Afghanistan.

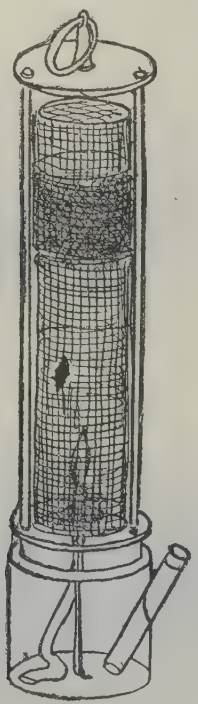
SAFETY ENGINEERING, the name given to the study of methods and appliances for the prevention of accidents in industry. Of recent years the matter has received much attention and has produced a nation-wide "Safety first" campaign. Its purpose is to reduce injury and loss of life caused by preventible accidents and it seeks first to introduce various safety devices, and secondly to educate the workers and the public to a realization of the need for greater care and thoughtfulness in a world in which the use of mechanical devices is continually on the increase. Contrary to general belief the education of the worker is found to be far more important than the use of mechanical safety devices. In a report made by the Industrial Commission of Wisconsin the statement is made: "We must conclude that the great majority of accidents are not preventible by guards. . . . If every danger-point on every machine were perfectly guarded, making accidents upon them impossible, then we would have eliminated just about one-fourth of all accidents." In other words, carelessness is the chief cause of accidents.

Mechanical safety devices are constantly being introduced and are, already, countless in number. They vary from simple metal guards placed around moving machinery to automatic devices which prevent, for instance, the moving of an elevator until its doors have been closed; and from simple gates across a level crossing to elaborate automatic signaling devices. Safety engineering also concerns itself with the prevention and extinguishing of fires, the provision of fire escapes, installation of safety-valves on boilers, adequate timbering and roofing of mines and tunnels, and with many other matters far too numerous to mention.

SAFETY LAMP. It has been long known that when methane, marsh gas, or light carbureted hydrogen, which is frequently disengaged in large quantities from coal seams, is mixed with 10 times its volume of atmospheric air, it becomes highly explosive. Moreover, this gas—the fire damp of miners—in exploding renders 10 times its bulk of atmospheric air unfit for respiration, and the choke damp thus produced is often as fatal to miners as the primary explosion. With the view of discovering some means of preventing these dangerous results, Davy instituted those important observations on flame which led him to the invention of the safety lamp. He found that when two vessels filled with a gaseous explosive mixture are connected by a narrow tube, and the contents of one fired, the flame is not communicated to the other, provided the diameter of the tube, its length, and the conducting power for heat of its material bear certain proportions to each other; the flame being extinguished by cooling, and its transmission rendered impossible. In this experiment high conducting power and diminished diameter compensate for diminution in length; and to such an extent may this shortening of

length be carried that metallic gauze, which may be looked on as a series of very short square tubes arranged side by side, completely arrests the passage of flame in explosive mixtures.

The first lamp which would safely burn in an explosive mixture of gas and air was contrived in 1813 by Dr. W. Reid Clanny of Sunderland. Into this lamp



DAVY SAFETY LAMP

fresh air was blown through water, and heated air escaped through water by means of a recurved tube. Such a lamp was unfit for ordinary use. George Stephenson invented a safety lamp which was tried at the Killingworth pits in 1815. Both Clanny and Stephenson applied wire gauze cylinders to their lamps after Davy's came into use, or at least after a communication about it had been made to the Royal Society in 1815. Portable electric lamps are now in general favor, but they give no warning of gas, and in mines much affected by gases the oil-safety lamp is in use.

SAFETY AT SEA. The principal dangers to life at sea are connected with stranding, foundering, collision and fire. These dangers are being reduced year by year through improvements in the design, construction and equipment of ships and through inventions and improvements in the conditions of navigation, many of which are revolutionary in their nature. Radio telegraphy is finding what is perhaps its most beneficent application, in communication at sea, where a ship in distress can now give notice of its danger to other ships and to shore stations hundreds of miles away; and a very recent development makes it possible for a ship hastening to her assistance, to locate her not only by reports of her latitude and longitude but by the direction from which her signals are coming. The same invention which makes this possible,—the "Radio-direction Finder"—makes it possible also for shore stations to guide a ship at sea and in a fog as accurately toward the entrance of the harbor she is seeking as if the lights and buoys of the entrance were plainly visible. A similar device for determining accurately the direction of sound, makes it possible for ships in a fog to locate and avoid each other, thus enormously reducing what is perhaps the most serious of all dangers at sea, collision in a fog. It is even proposed today to lay a wire along the bottom of a channel and, by sending through it a current of electricity, to enable a ship to follow the channel perfectly, no matter how tortuous it may be; and this in the thickest fog and with the helmsman blindfolded.

The service of weather observation and report is improving steadily and both its sources of information and the area covered by its warnings are being greatly extended. Dangerous storms are located almost at their origin and tracked not only day by day but hour by hour, notices being sent broadcast through the air predicting their future movements with such accuracy that they are easily avoided by ships which can afford the time to give them a wide berth. The latest plan of the United States weather service is to maintain a number of small vessels during the hurricane season, in the Caribbean Sea, where most of the Atlantic tropical storms have their origin, to study these storms by actually seeking them and accompanying them on their course.

In spite of all that has been done and all that can be done to reduce the dangers of the sea, disasters still occur and will continue to occur; and the problem of minimizing their effects is receiving more attention than was ever devoted to it in days when the dangers were far greater than at present and disasters far more frequent.

The details of construction of ships and especially of ships carrying passengers, are prescribed by laws enforced by careful inspection which begins with the building of the ship and follows it

throughout its whole career. The ship having been completed in accordance with requirements, the law looks next to the officers and crew and to the equipment of life-boats and other safety appliances. Rules cover the nature and stowage of the cargo and the depth to which the ship may be loaded. A limit is set to the number of passengers that may be carried, and these must never exceed those for whom accommodation is provided in life-boats and life-rafts of approved type. Rules for the avoidance of collision have been drawn up through international agreement, covering as fully as possible every situation that can arise when vessels are meeting or crossing each other's courses.

Among the most important features involved in the prescribed designs of ships, is the requirement for a thorough subdivision of the ship into water-tight compartments of such size that the flooding of one or even two of these compartments through collision or stranding will leave the ship with sufficient buoyancy to remain afloat. Where communication is necessary between adjoining compartments, water-tight doors must be fitted with arrangements for closing quickly, and in certain cases, automatically. Other requirements as to the ship itself have to do with boilers and machinery, with steering gear, with pumps and fire-fighting apparatus. The rules governing life-boats are especially strict and include methods of stowing and launching,—features which were too often neglected until made the subject of special rules in recent years.

The laws which have been mentioned as covering the construction of ships have reduced to a minimum the chances of foundering in the open sea. Disasters of this nature, formerly among the most common of disasters at sea, are now extremely rare and should be practically unknown except when a small ship is contending with a hurricane of great violence. A vessel of size sufficient to be rated as a passenger carrier, constructed in accordance with present-day laws, with water-tight compartments that are in fact water-tight, with cargo properly limited and properly stowed, and handled in accordance with the dictates of sound seamanship, should be able to ride out any gale so long as she has plenty of sea-room. It is near the shore that gales and fog are most to be feared; for there conditions may prevent the manœuvers that would insure safety.

Danger from fire, once the most dreaded of all sea dangers, has been robbed of most of its terrors by the substitution of steel for wood in the interior fittings of steamers as well as in construction of the hulls; and it is only when a cargo of explosives or inflammable material is carried that the danger from this source becomes great. Here, again, modern law steps in to protect passengers, by limiting the conditions under which inflammable cargo, and especially explosives, may be carried. As a rule, they are not permitted at all on ships designed primarily for passenger traffic.

No degree of perfection in the equipment of a ship can insure the safety of the ship or the passengers and crew unless the use of the equipment is thoroughly understood. On a well-ordered ship, drills are frequent, especially in fighting fire and handling boats, and these drills are doubly useful if they include participation,—necessarily superficial,—by the passengers. Every passenger should understand the significance of danger signals and what his part is to be in co-operation with the officers and crew. Every passenger should be furnished a list of all signals which concern him, together with information as to the location and fitting of life-belts, and, most important of all, the number and location of the life-boat to which he is assigned. A preliminary drill at lowering boats should always be held before leaving port and the boats inspected as to their fittings and equipment; and as soon as convenient after leaving port, a drill at "Stations for Emergency" should be held, and each passenger required to go to the life-boat which he is to enter in case it becomes necessary to abandon the ship.

In addition to the normal equipment of the boats, each one should be provided with provisions and water sufficient for all occupants for at least a week. Other important items to be insisted upon are: compass, lead-line, lantern, rockets and other fire-works for signaling, buckets for bailing and other necessary purposes, mast and sails (may be useful for "sea-anchor"), navigational books and instruments.

Information should be given to all boats, of the course and distance to the nearest land or steamship lane.

Boats should be instructed to keep together if possible under authority of the senior officer of the group.

The rules regulating all of the matters that have been described are for United States vessels established by Congress and by regulations of the "Steam Boat Inspection Service" of the Department of Commerce, and are published in a pamphlet entitled "General Rules and Regulations prescribed by the Board of Supervising Inspectors."

For many years before the matter of safety at sea was taken up seriously by various maritime governments, many of

the questions involved were efficiently controlled by private companies interested in marine insurance. These companies based their rates for insurance upon requirements of their own making which covered primarily matters involved in the safety of the ship and cargo, but which at the same time covered, necessarily, safety of life, though omitting many details now covered by laws which make safety of life their first concern. The principal companies of this kind are the following: The Bureau Veritas, French (1828); Lloyd's Register, British (1834); The German Lloyd, German (1867); and The American Bureau of Shipping (1867). These companies will doubtless continue their existence and activities, which are purely commercial, not humanitarian, although their work is to a great extent duplicated by the governmental agencies above described.

SAFETY VALVE, a valve which automatically opens to permit steam to escape or air to enter the boiler in order to prevent its explosion or collapse. Of these there are two kinds, the one internal, opening to the inner side when the pressure of steam is less than a given weight; the other opening to the outside when the pressure of steam exceeds a given weight.

SAFFI, or **ASFI**, a seaport of Morocco, on a bay on the Mediterranean coast, 102 miles W. N. W. of the city of Morocco. It is a compactly built place, dominated by a fine ruined castle of the Sultans of Morocco dating from the 16th century. The place was held by the Portuguese for several years; they abandoned it in 1648. The fortifications they built still stand in part. The shrine of the Seven Sleepers here is visited by both Moslems and Jews. Saffi was at one time the chief seat of the trade of Morocco with Europe, and, though it has declined since the rise of Mogador, it still exports beans, maize, peas, wool, olive oil, and imports cottons, sugar, etc.

SAFFLOWER, or **BASTARD SAFFRON** (*Carthamus tinctorius*), a large thistle - like plant with orange - colored flowers, natural order *Compositæ*. It is cultivated in China, India, Egypt, and in the S. of Europe. An oil is expressed from the seeds, which is used as a lamp oil. The dried flowers afford two coloring matters (also called safflower), a yellow and a red, the latter (carthamine) being that for which they are most valued. They are chiefly used for dyeing silk, affording various shades of pink, rose, crimson, and scarlet. Mixed with finely-powdered talc, safflower forms a common variety of rouge. In some places it is used in lieu of the more expensive saffron, and for adulterating the latter. The oil, in large doses, acts as a purgative.

SAFFORD, WILLIAM EDWIN, an American botanist, born at Chillicothe, Ohio, in 1859. He graduated from the United States Naval Academy in 1880 and took post-graduate studies at Yale and Harvard. From 1880 to 1902 he was engaged in collecting for the United States National Museum in the departments of ethnology and ethnobotany. From 1902 to 1915 he was assistant botanist, and from the latter date was economic botanist of the Department of Agriculture. He conducted an expedition to South America for the Chicago Exposition. In 1898–90 he was vice-governor of the Island of Guam. He was a member of many learned societies. His writings include: "A Year on the Island of Guam" (1904); "An Aztec Narcotic" (1915); "Natural History of Paradise Key and the Nearby Everglades of Florida" (1919); and articles on botanical subjects to several encyclopædias.

SAFFRON, in botany, the *Crocus sativus*, a species with light purple flowers which come out in autumn. It grows in the S. of Europe and in parts of Asia. It is extensively cultivated in France, Austria and Spain, as it formerly was in England. The Spanish variety is the best for commercial purposes, though it is said that 100,000 flowers are necessary to produce one pound of saffron. The stigmas of the flower are from 1 to 1½ inches in length, narrow and rounded where they are attached to the style, but spreading and club-shaped near the extremity, which is truncated. They have an orange or brownish-red color, yellow in the narrower part, and an agreeable aromatic odor. The dried stigmas of the saffron crocus are sometimes used in dyeing and for coloring tinctures. They have a bitter taste, and impart a yellow color to water, alcohol, and oils. It was formerly met with in two forms, viz., hay saffron and cake saffron, but the former is now alone in demand. Saffron is slightly stimulant. It is used in the treatment of exanthemata, but chiefly as a coloring agent in preparing medicines and in cookery. The natives in India use saffron as a remedy in fever, melancholia, catarrhal affections of children, and as a coloring matter in some dishes.

SAGA, an ancient Scandinavian tale, legend, or tradition, of considerable length, and relating either historical or mythical events; a tale, a history, a story, a legend. The Scandinavian sagas were compiled chiefly in the 12th and three fol-

lowing centuries. The most remarkable are those of Lodbrok, Hervara, Vilkina, Völsunga, Blomsturvalla, Yynglinga, Olaf Tryggva-Sonar, with those of Jomsvikingia and of Knytlinga (which contain the legendary history of Iceland), the Heims-Kringla and New Edda, due to Snorri Sturlason.

SAGA, a town of Japan, capitol of the province of Hizen, on the island of Kioo Lioo 74 miles N. E. of Nagasaki. It is important as a seaport and commercial center. A large number of brooks and channels traverse the town. The most important channel is that of Sentonofutsi, 50 miles in length. It unites the Gulf of Simabara with the Northern Sea, and greatly conduces to the inland commerce of the island. Pop. about 38,000.

SAGAPENUM, a fetid gum-resin brought from Persia and Alexandria, and generally believed to be furnished by some species of the genus *Ferula*. It occurs either in tears or irregular masses of a dirty brownish color, containing in the interior white or yellowish grains. It has an odor of garlic, and a hot, acrid, bitterish taste. It is occasionally used in medicine as a nervine and stimulating expectorant.

SAGAR, or **SAUGOR**, a well-built town in the Central Provinces of India, in a hilly tract, on a feeder of the Jumna. There are here a Mahratta fort, now converted into British stores, barracks, and a magazine, as well as a jail (1846) and a park (1862); and there were formerly a college (removed to Jabalpur) and a mint (removed to Calcutta). Sagar has a trade in salt, sugar, and cloth. Pop. about 44,000.

SAGAR, a low, swampy island at the mouth of the Hugli, the holiest branch of the Ganges; it is particularly sacred in the estimation of the Hindus. Multitudes of pilgrims annually resort to it in January, and after the three days' festival of purification is over a great fair is held. The island has an area of 225 square miles, but is very thinly inhabited, the greater part being jungle, the haunt of tigers and other wild animals. A lighthouse (1808), a meteorological observatory, and a telegraph station are the chief buildings.

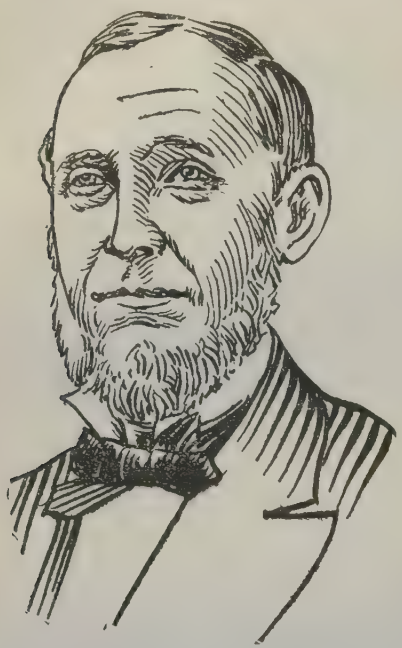
SAGE, the genus *Salva*, specifically *S. officinalis* and *S. grandiflora*. The first of these is the common garden sage, a native of the S. of Europe. It has blue flowers, and has run into many varieties. Formerly it had a high reputation as a sudorific, an aromatic, an astringent, and an antiseptic, but it has not now a place in the pharmacopœia. The Chinese use it as a tonic for debility of the stomach and nerves. It is employed in cooking for sauces and stuffing for luscious meats. Also the genus *Artemisia*.

SAGE, HENRY WILLIAMS, an American philanthropist; born in Middletown, Conn., Jan. 31, 1814; engaged in business with his uncle in 1832–1854, when he became interested in the lumber regions of Canada and the West, where he bought large tracts of timber and became one of the most extensive land owners in Michigan. He was elected to the Legislature in 1847 and subsequently associated himself with many philanthropic schemes. His early benefactions included the endowment of the Lyman Beecher lectureship at Yale College, the building and endowment of several churches and schools, and the building of the public library at West Bay City, Mich. He was elected a trustee of Cornell University in 1870, and gave to that institution $266,000 for the Sage College for Women; $50,000 for the Susan Lynn Sage chair of philosophy; $200,000 for the Sage School of Philosophy; $260,000 and an endowment of $300,000 for the University Library Building; and over $70,000 to other departments. He died in Ithaca, N. Y., Sept. 17, 1897.

SAGE, MARGARET OLIVIA SLOCUM (Mrs. Russell Sage), an American philanthropist, born in Syracuse, N. Y., in 1828. She was a graduate of the Emma Willard Seminary, and for years taught school, in Troy, N. Y., and elsewhere. When past forty she met RUSSELL SAGE (*q. v.*), who was then a prospering grocer in Troy. Mrs. Sage was throughout all her life keenly sympathetic toward equal suffrage for women. She was also a keen business woman, and during the last five years of her husband's life transacted all his business affairs. At his death she had at her disposal $70,000,000, of which $30,000,000 were devoted to a long series of philanthropies. She died in 1918.

SAGE, RUSSELL, an American capitalist and philanthropist, born in Verona, Oneida co., New York, in 1816. He had only a country school education and at a very early age entered his brother's grocery store as clerk. In 1837 he went into a small business for himself, but gradually prospered, until he was able to go into the wholesale business. From 1841 to 1847 he was an alderman in Troy, N. Y., and in 1853 was elected to Congress by the Whigs. In 1863 he removed to New York and entered the brokerage business, gradually building up a large fortune by speculation in securities, especially of railroads. At the time of his

death he had acquired $70,000,000, after having devoted large sums to various philanthropic institutions. His biggest donation was toward the Russell Sage Foundation, whose purpose was to inquire into the sources of poverty and seek their elimination. He died in 1906.



RUSSELL SAGE

SAGEBRUSH (*Artemisia Ludoviciana*), a low irregular shrub of the order *Compositæ*, growing in dry alkaline soils of the North American plains. The name is also given to other American species of *Artemisia*.

SAGE COCK, the *Centrocercus urophasianus*, called also cock of the plains. It is the largest of the American grouse, and the male has a distinctive character in the bare spaces of orange-colored skin on each side of the neck, which he inflates during the mating season. Range from the Black Hills to California and Oregon, and from British Columbia nearly to Arizona. It feeds on the wormwood of the plains, and in consequence its flesh becomes so bitter as to be unfit for food.

SAGES OF GREECE, SEVEN, Solon, Chilo, Pittacus, Bias, Periander, Cleobulus, and Thales are those most generally named as the seven wise men of Greece, and they were the authors of the celebrated mottoes inscribed in more recent times in the Delphian Temple. Solon, through the imprudent course of his father, was compelled to engage in commercial adventures in other lands. His work on returning to Athens was that of a wise, unselfish patriot, who sought to compose the distractions, social and political, which then rent the city. His motto was, "Know thyself." Chilo, one of the ephori, was a Spartan, who early directed his attention to public affairs, and many of whose maxims are quoted by the ancient writers; one of the most famous of these was, "Consider the end." Pittacus was a native of Mytilene, in Lesbos, became a soldier, rose to supreme power in the state, acted with great patriotism, and having done much for the people, voluntarily resigned his power. "Know thy opportunity," or, as it is sometimes rendered, "Be watchful of opportunities," is attributed to him. Bias, a native of Ionia, was a poetical philosopher, who studied the laws of his country and employed his knowledge in the service of his friends, defending them in the courts of justice. Said Bias: "Most men are bad." Periander was distinguished for his love of science and literature, which entitled him to be ranked among the seven wise men of Greece. Of Cleobulus, of the island of Rhodes, who was remarkable for strength and beauty, but little is known. His favorite maxim was, "Avoid excesses." Thales, a celebrated philosopher, born at Miletus, and founder of the Ionic sect, traveled like Solon, and it is said learned, while at Memphis, geometry, philosophy, and astronomy. He is said also to have invented several fundamental propositions which were afterward incorporated into the elements of Euclid. He taught the Greeks the division of the heavens into five zones, and the solstitial and equinoctial points.

SAGHALIEN. See SAKHALIN.

SAG HARBOR, a village in Suffolk co., Long Island, N. Y.; on Gardiner's Bay, and on the Long Island railroad; 100 miles E. by N. of New York City. There is an excellent harbor and regular steamboat connections with New York. Here are a union school, the Academy of the Sacred Heart of Mercy (R. C.), several banks, two weekly newspapers, and many handsome summer residences of New York business men. The village has flour and cotton mills, and manufactories of tools, watch cases, cigars, and leather. Sag Harbor was originally the site of Indian settlements, and many interesting relics have here been exhumed. The population varies, being larger during the summer season than at other times.

SAGINA, in botany, the pearlwort, a genus of *Alsineæ*. Sepals four or five; petals four or five, entire or emarginate, sometimes wanting; stamens 4 to 10; styles four or five; capsule four- to five-valved. Known species eight, from the temperate zones. All but *S. saxatilis* and *S. nivalis*, which are Alpine species, are common.

SAGINAW, a city of Michigan, the county-seat of Saginaw co. It is on the Saginaw river, and on the Grand Trunk, the Michigan Central, and Père Marquette railroads. The river here is spanned by 11 bridges, 4 of which are railroad and 7 public bridges. The city has an excellent street system and most of the important roadways are paved with asphalt and brick. There is an extensive park system including Hoyt, Linton, Ezra Rust, and Bliss parks. The city also contains two excellent libraries, the Hoyt Library and the Public Library. It is the seat of the Michigan Institute for the Blind, the Old Folks' Home, and the Germania Institute. Its educational institutions include a free manual training school given to the city by Hon. W. R. Burt. There is also a trade school, the gift of Hon. Arthur Hill. Other notable buildings include three Masonic temples, a court house, city hall, and two hospitals. Also an Elks temple, Y. M. C. A. and Y. W. C. A. buildings, and a post-office. During the lumber era of Michigan, Saginaw was one of the chief scenes of the lumber trade. The lumbering industry is still important. Within recent years extensive beds of bituminous coal have been discovered in the neighborhood of the city, and over 2,000,000 tons are mined annually. The beet sugar industry is an important one in the surrounding country. Among the other leading industries are the manufacture of glass, lumber, salt, and many other products. The city has an important wholesale trade with the surrounding country. Pop. (1910) 50,510; (1920) 61,903.

SAGINAW BAY, the largest indenture of Lake Huron on the United States side entering the S. peninsula of Michigan, in the eastern part of the State. It is 60 miles long, 30 miles in extreme width, and is bordered by Iosco Bay, and Tuscola and Huron counties. It affords excellent navigation, and is a safe harbor for large vessels. Its surface is usually rough, but not dangerously so, when the open lake is comparatively smooth. The color of the water is plainly different from that of the open lake, being a brownish-green, often termed "tea-water."

SAGITTA, in astronomy, the Arrow; a small northern constellation, one of the 48 ancient asterisms. It is situated between the hill of the Swan and Aquila, and is traversed by a branch of the Milky Way. A nebula in Sagitta was resolved by Sir William Herschel, in 1783, into a cluster of stars. In geometry, (1) the versed sine of an arc. (From the resemblance of an arrow standing upright on the string of a bow.) (2) The abscissa of a curve. In zoölogy, the sole genus of *Chætognatha*, with several species, found on the surface of the ocean all over the world. They are transparent unsegmented worms, about an inch long. The genus presents analogies with both the *Nematoidea* and the *Ammelida*.

SAGITTARIUS (the Archer), in astronomy, the ninth sign of the zodiac, into which the sun enters Nov. 22. The constellation consists of eight visible stars. It is represented on celestial globes and charts by the figure of a centaur in the act of shooting an arrow from his bow.

SAGITTATE, in botany, a term applied to the form of leaf shaped like the head of an arrow; triangular, hollowed at the base, with angles at the hinder part.

SAGO, a nutritive farinaceous substance obtained from the pith of several species of palms, principally, however, from *Sagus* (*Metroxylon*) *Rumphii*, the spiny, and *S. lævis*, which is spineless. For the natives of the eastern Archipelago this palm is a source of vegetable food naturally more abundant and less variable in its yield than rice. The stem consists of a thin hard wall, about two inches thick, and of an enormous volume of a spongy medullary substance, which is edible. Each tree yields about 600 pounds of pith. There are three well-marked varieties of this palm. The tree grows in Java, Sumatra, Celebes, Borneo, Malacca, and Siam. The only countries, however, where it is found growing in large forests are New Guinea, the Moluccas, Celebes, Mindanao, Borneo, and Sumatra, being widely spread over the Moluccas, but confined to particular parts of the others. A tree becomes mature at about 15 years.

These palms propagate themselves by lateral shoots as well as by seed, and they die after producing fruit, so that a sago plantation once formed is perpetual. Large quantities of the meal in its pure state are sent to Singapore from the eastern islands, where it is granulated or pearled and bleached by the Chinese for shipment to Europe. It comes into commerce in three forms, the common brown sago, pearl sago, and sago flour. It is made by two processes, the starch grains being burst in some samples and not in others.

The chief uses of sago in Europe are for feeding stock, making starch, and in giving thickness and consistency to cocoa.

The stem, about 15 to 20 feet, is cut into lengths, split open, and the pith dug out and placed in a vessel with a sieve bottom. Water is applied to separate the flour and carry it into a second vessel, where it is soon deposited. The water is then run off, and the flour dried. The produce of a tree ranges from 600 to 750 pounds. Pearl sago (which the Chinese of Malacca prepare and send to Singapore) is in small white spherical grains. There are several varieties which differ much in color, some being white and others reddish brown. One kind of granulated sago from India has been introduced under the name of tapioca—the real TAPIOCA (*q. v.*) being a totally different substance. Sago is not entirely soluble in hot water like ordinary starch, and can therefore be employed in making puddings, etc.

SAGOIN, or **SAGOUIN**, the native South American name of a genus (*Callithrix*) of Brazilian monkeys of small size, and remarkably light, active, and graceful in their movements.

SAGUENAY, a river of Canada, in the province of Quebec; formed by two outlets of Lake St. John, which unite about 9 miles below the lake, from which point the river flows S. E. and falls into the St. Lawrence at Tadousac harbor; length about 100 miles. For many miles of the latter part of its course the banks are very lofty, and in some parts there are precipices more than 1,000 feet high. Ships moor at rings fixed into some of the precipitous walls of rock, the water being so deep as to be unsuitable for anchorage. The Saguenay is navigable for vessels of any size to Ha Ha Bay, a distance of about 50 miles to 60 miles from the St. Lawrence, and at high water for vessels of large dimensions from 15 miles to 18 miles farther. It is visited by a great many tourists on account of its remarkable scenery.

SAGUNTUM, a former town of Spain, S. of the Ebro, about 3 miles from the coast. It is famous in Roman history; its siege by Hannibal in 219–218 B. C. having given rise to the second Punic War. The site is occupied by the modern town of Murviedro.

SAHARA (Arabic Sáh'ra), the vast desert region of North Africa, stretching from the Atlantic to the Nile, and from the S. confines of Morocco, Algeria, Tunis, and Tripoli S. to the vicinity of the Niger and Lake Tchad. It is usual to regard the Libyan Desert, lying between Egypt, the Central Sudan, and Tripoli, as a separate division. Both are, however, links in the chain of great deserts that girdle the Old World from the Atlantic coast across Africa, Arabia, Persia, Turkestan, and Mongolia to the Pacific. It was long customary to assert that the Sahara was the bed of an ancient inland sea, and that it consisted of a vast, uniform expanse of sand, swept up here and there into ridges by the wind. But this idea is utterly erroneous. Since the French became masters of Algeria, they have completely revolutionized our knowledge of the Sahara, at all events of the country immediately to the S. of Algeria and Tunis. The surface, instead of being uniform and depressed below sea-level, is highly diversified, and attains in one place an altitude of fully 8,000 feet.

From the neighborhood of Cape Blanco in the W. a vast bow or semicircle of sand-dunes stretches right round the N. side of the Sahara to Fezzan, skirting the Atlas Mountains and the mountains of Algeria. This long belt of sand hills varies in width from 50 to 300 miles, and is known by the names Igidi and Erg, both meaning "sand hills." The hills rise to 300 feet (in one place, it is said, to more than 1,000 feet), though the average elevation is about 70 feet. Water is nearly always to be found below the surface in the hollows between the different chains of these sand hills, and there a few dry plants struggle to maintain a miserable existence. S. of Algeria, on the other side of the Erg, the country rises into the lofty plateau of Ahaggar (4,000 feet), which fills all the middle parts of the Sahara. Its surface runs up into veritable mountains 6,500 feet high, which, incredible as it may seem, are covered with snow for three months in the year. On the S. it apparently falls again toward the basins of the Niger and Lake Tchad; nevertheless there are mountain ranges along the E. side reaching 8,000 feet in Mount Tusidde in the Tibbu country, and a mountain knot in the oasis of Air (or Asben) which reaches up to 6,500 feet. Mountainous tracts occur also in the W., between Morocco and Timbuctoo, but of inferior elevation (2,000 feet). These mountainous parts embrace many deep valleys, most of them seamed with the dry beds of ancient rivers, as the Igharghar and the Mya, both going some hundreds of miles N. toward the "shotts" of Algeria and Tunis. These valleys always yield an abundance of water, if not on the surface in the watercourses, then a short distance below it, and are mostly inhabited, and grazed by the cattle and sheep and camels of the natives.

Another characteristic type of Saharan landscape is a low plateau strewn with rough blocks of granite and other rocks, and perfectly barren. In very many parts of the Sahara, especially in the valleys of the mountainous parts, in the recesses or bays at the foot of the hills, alongside the watercourses, and in the hollows of the sand-dunes, in all which localities water is wont to exist, there are oases—habitable, cultivable spots, islands of verdure in the midst of the ocean of desert. These oases occur in greatest number along the S. face of the Atlas and the Algerian mountains, on the N. side of the Ahaggar plateau. These lines of oases mark the great caravan routes between the Central Sudan States and the Mediterranean.

A large portion of the Sahara, though not the whole, was undoubtedly under water at one time, probably in the Cretaceous period and earlier. Then the surface seems to have been in great part elevated, so that the waters remained only in some lakes and in gulfs near the Mediterranean coast. The Romans had colonies or military posts a long way S., in what are now desert regions; and both Herodotus and Pliny tell us that the elephant, the rhinoceros, and the crocodile, all animals that only live near abundant supplies of water, were common throughout North Africa in their day. None of the Egyptian inscriptions or animal sculptures represent the camel, nor do the Greek and Roman historians mention it either as being a denizen of North Africa. The camel is now the principal carrier across the Sahara, and must have been introduced since the beginning of the Christian era. The inference from these and other facts is that the process of desiccation has gone on more rapidly during the last 2,000 years.

The range of temperature is exceedingly great: often the thermometer falls from considerably more than 100° F. during the day to just below freezing-point at night. In the W. of the Sahara the daily average is 85° in the shade in the month of May. Rain does fall in certain parts of the Sahara with more or less frequency; but in most districts on the average after intervals of two to five years.

The plant life is very rich in the oases, the date palm, which has its home in these regions, being the most valuable possession of these fertile spots. But fruit trees, as oranges, lemons, peaches, figs, pomegranates, etc., are also grown, with cereals, rice, durrha, millet, and such-like food crops. In the desert regions the plant life is confined principally to tamarisks, prickly acacias and similar thorny shrubs and trees, salsolaceæ, and coarse grasses. The animals most commonly met with include the giraffe, two or three kinds of antelope, wild cattle, the wild ass, desert fox, jackal, hare, lion (only on the borders of the desert), ostrich, desert lark, crow, viper, and python. The people keep as domestic animals the camel, horse, sheep, and goat.

The human inhabitants, who are estimated altogether at about 2,000,000, consist of Moors, Tuareg, Tibbu, Negroes, Arabs, and Jews. The Moors and Tuareg are both Berbers; the former live between Morocco and Senegal, the latter in the middle, S. of Algeria and Tunis. The Tuareg are great traders, and control the principal caravan routes. The Tibbu, who number about 200,000, occupy the oases between Fezzan and Lake Tchad. The Arabs of pure stock are very few; they have become mixed with the Berbers and the Negroes. The most valuable products of the Sahara are dates and salt, the latter collected on the salt pans, and made from the rock-salt of the Taudeni in the W., and of Kawar (Bilma) in the E.; the remaining products are horses, soda, and a little saltpeter. But for many long years there has been a very active trade carried on by caravans between the central Sudan and Niger countries and the Mediterranean states, the ivory, ostrich feathers, gums, spices, musk, hides, gold dust, indigo, cotton, palm oil, shea butter, kola nuts, ground nuts, silver, dates, salt, and alum of the interior lands being exchanged for the manufactured wares (textiles, weapons, gunpowder, etc.) of European countries.

Scientific men have eagerly discussed the possibility of reclaiming the Sahara from the arid desolation to which such a vast proportion of its surface is now abandoned. One scheme has been carried out with success in limited areas. It consists in boring of artesian wells, and with the water so obtained irrigating the soil in the vicinity. This method of reclaiming the desert has been prosecuted by the French with great energy since 1856. Water is generally found at depths varying from 10 to 300 feet, and in great abundance. Wherever these wells have been bored the date palm groves and the orchards have increased greatly in extent, and the population has become much denser.

SAHARANPUR, a town of British India, in the Northwest Provinces; 111 miles N. of Delhi; is the station for the hill sanatorium of Masuri. It has an old Rohilla fort, a handsome new mosque, St. Thomas' Church (1858), numerous administrative offices, and government botanical gardens (1817). Pop. about 63,000.

SAHIB, a common term used by natives of India and Persia in addressing or speaking of Europeans. The feminine form is Sahibah.

SAHLITE, in mineralogy, a name formerly applied to a grayish-green variety of pyroxene from Sala; but now adopted by Dana and others for a group, viz., the lime-magnesia-iron pyroxene.

SAI, the name applied to the weeper-monkey of Brazil.

SAIGA, in zoölogy, a genus of *Bovidæ*, with one species, *S. tartarica*, from eastern Europe and western Asia. They differ so much from all other antelopes that some naturalists have made them a distinct family. Also, any individual of the genus *Saiga*. They are about the size of a fallow deer, tawny yellow in summer, and light gray in winter; horns, found only in the male, less than a foot long, slightly lyrate and annulated.

SAIGON, capital of French Cochin-China; on the Saigon, a branch of the delta of the Mekhong; about 35 miles from the sea. The present town has grown up under French influences since 1861, and with its fine streets and squares and boulevards is one of the handsomest cities of the East. It has a magnificent governor's palace, a cathedral (1877), two higher colleges, an arsenal, floating dock and drydock, administrative offices, and a botanical and zoölogical garden. Saigon (properly Gia-dinh) is the most important port between Singapore and Hong Kong. It exports every year rice, chiefly to China, the Philippines, Japan, and the Straits Settlements. The remaining exports include fish, salt, cotton, wood, beans, and hides. Previous to the French occupation (1861) Saigon, though only a collection of common Siamese huts, was the capital of the province of Lower Cochin-China. Pop. (1919) 64,496, principally Chinese, Annamese, and French.

SAIL, a piece of canvas cloth spread to catch the wind, so as to cause or assist in causing a ship or boat to move through the water. Sails are supported by the masts, spars, or stays of the vessel, and take their names from the mast, yard, or stay on which they are stretched, as the mainsail, etc. The upper edge of a sail is the head, the lower edge the foot, the vertical edge the leech, the weather side or edge (that is, the side or edge next the mast or stay to which it is attached) of any but a square-sail is the luff, and the other edge the after leech. The clews or clues are the lower corners of a square sail, or the lower after corner of a fore-and-aft sail. A tack is the lower weather corner of a square sail, or the lower forward corner of a fore-and-aft sail. The earing is the upper corner of a square sail. A square sail is one that is extended by a yard hung (slung) by the middle and balanced. A sail set on a gaff, boom, or stay is called a fore-and-aft sail. Also, that part of the arm of a windmill which catches the wind.

SAILCLOTH, a strong linen, cotton, or hempen cloth used in making sails. The best is made of flax, and combines flexibility with lightness and strength.

SAILING, the act of moving on water, or the movement of a ship or vessel impelled by the action of wind on her sails; act of setting sail or beginning a voyage; also, smooth impulsion through the air, as in a balloon; or the aërial passage of a bird. In navigation, the art of directing a ship on a given line laid down on a chart. It is called plane sailing when the chart is constructed on the supposition that the surface of the ocean is an extended plane; and globular sailing, when the chart is a globular chart, or constructed on the hypothesis that the earth is a sphere, the ship being then supposed to be sailing on the arc of a great circle. Sailing order, or order of sailing, is any determinate order preserved by a squadron of ships. It usually implied, in the days of sailing fleets, one, two, or three parallel columns; but it is at the disposition of the admiral or commodore.

SAINFOIN, a plant, *Onobrychis sativa*, natural order *Leguminosæ*, a native of central and southern Europe and part of Asia. It has been in cultivation for centuries for the purpose of supplying fodder for cattle either in the green state or converted into hay. It is a pretty plant with narrow pinnate leaves and long spikes of bright pink flowers; stem 1½–2 feet high.

SAINT, a name applied in the New Testament to the members of the Christian community generally, but restricted by ecclesiastical usage from very early times to those who have been specially remarkable for their personal virtues and their eminent services to the cause of religion. In the ages of persecution the quality which most of all challenged the admiration and reverence of the faithful was naturally constancy in the profession and the defense of the Christian faith; and the honors of the martyrs, even before the age of persecution had passed, were extended to confessors, and eventually to all who died in the odor of sanctity, and especially to those who also obtained the reputation of performing miracles. In general, the saints of the Catholic Church are distributed into sev-

eral classes, chiefly in relation to the special character of the ecclesiastical offices appropriated to their honor. Thus we find enumerated (1) apostles and evangelists; (2) martyrs; (3) confessors, a name applied primitively to those who had courageously undergone imprisonment or pains for the faith without gaining the final crown of martyrdom, but in later times understood of all who, not being martyrs, were eminent for sanctity of life; (4) doctors or saints eminent for sacred learning; (5) virgins; (6) matrons and widows. Anciently the title of saint was bestowed on an individual by the members of the particular Christian community to which he belonged, or to which his merits were most familiar. It was not till the 12th century that the Pope reserved to himself the exclusive right to add to the roll of saints, or that a regular form of procedure was established in the Roman courts for the purpose of testing and of solemnly pronouncing on the title of persons, who had died with a reputation for sanctity, to the public *cultus* of the Church. A saint, according to the received interpretation, is one who has exercised the three theological virtues of faith, hope, and charity, and the cardinal virtues, prudence, justice, fortitude, in a heroic degree, and has persevered in this exercise till death. Sanctity may exist without miracles; as, according to one of the most commonly alleged instances, there is no record of John the Baptist having wrought miracles; and, on the other hand, miracles may be performed by heretics or sinners. Nevertheless, by the existing discipline of the Roman Church, before a decree of canonization can be obtained, the rule requires evidence of such miracles as an expected fruit of heroic faith and as a confirmatory sign of sanctity after proof has been given of the heroic virtues. The most notable canonization of modern times was that of Joan of Arc in 1920. This was due to the spiritual inspiration rendered by her memory to the French armies and people during the World War.

In Christian art representations of the saints are often marked by the nimbus, aureole, or glory, and many of the saints are pictured as accompanied by emblems, by which they could readily be recognized. Apart from symbols which only typified the person indicated (as a shepherd for Christ, a gourd or a whale for Jonah), the figure of the saint is given with an added emblem. Thus the four evangelists were symbolized by four rivers, the four rivers of paradise. The adoption of the four living creatures (Rev. iv. 6) for the same purpose does not appear to have taken place till the 5th century; but soon it became a constant practice to represent St. Matthew by or with the man, Mark with the lion, Luke with the ox, John with the eagle. The 12 apostles are depicted as 12 men, 12 sheep, or 12 doves. St. Peter (for obvious reasons) is represented with the keys or with a fish; many of the saints with the instruments by which they were martyred—St. Paul with a sword; St. Andrew with a cross; St. Simon with a saw; St. James the Less with a club; St. Matthew with a lance; St. Catharine with a wheel; St. Lawrence with a gridiron; others with objects connected with their history or in some other way—St. George with a dragon; St. Matthew with a purse. St. James the Elder is figured as a pilgrim.

ST. ALBANS, a city and county-seat of Franklin co., Vt.; on the Central Vermont railroad; 3 miles E. of Lake Champlain, and 59 miles N. N. W. of Montpelier. It is built on elevated grounds surrounded by a fertile agricultural region as well as by beautiful scenery. It contains a number of sulphur springs which add to its attractions as a summer resort. The city contains St. Albans Academy, the Warner Home for Little Wanderers, Warner Hospital, Franklin Library, Villa Barlow Convent, electric lights, National and State banks, and daily, weekly, and monthly periodicals. It has large locomotive and railroad car works, cotton mills, bridge works, steel works, and one of the largest creameries in the world. In 1864 St. Albans was raided by Confederates from Canada, and in 1866 was for a time a Fenian headquarters. It was chartered as a city in 1897. Pop. (1910) 6,381; (1920) 7,588.

ST. ALBANS, a municipal borough and cathedral city in Hertfordshire, England, 24 miles N. W. of London. It stands close to the site of the ancient Verulamium, and owes its name to St. Albans, the proto-martyr of Britain. St. Albans figures prominently in English history, and two battles were fought here (1455 and 1461) between the rival houses of York and Lancaster. The cathedral is a large and beautiful structure recently restored, and St. Michael's contains the remains of and a monument to Lord Bacon. Straw plaiting and silk throwing are the chief industries. By a readjustment of the dioceses of Rochester and Winchester, the See of St. Albans was created in 1877. St. Albans gives its name to one of the parliamentary divisions of Hertfordshire. Pop. about 18,000.

ST. ALDWYN, MICHAEL EDWARD HICKS-BEACH, LORD, born at London, Oct. 23, 1837. He was educated at Eton and at Christchurch College, Oxford. In

1864 he was elected M. P. for East Gloucestershire by the Conservatives. He became successively Under Secretary for the Home Department, Secretary to the Poor Law Board (1868), Chief Secretary for Ireland (1874), and Secretary for the Colonies (1878). In 1885 he was made Chancellor of the Exchequer by Lord Salisbury, and Conservative leader in the House of Commons; and in 1888 he became President of the Board of Trade. On the defeat of Lord Rosebery's ministry in 1895, he again held the office of Chancellor of the Exchequer till 1902, when on Lord Salisbury's retirement he resigned. He was founder of the Unionist Free Food League. In 1906 he was created Viscount St. Aldwyn, and in 1915 Earl. He died in 1916.

SAINT-AMANT, MARC ANTOINE GIRARD, SIEUR DE, a French writer of bacchanalian verses; born in Rouen, France, in 1594. He wrote "Moses Saved" (1653), an epic of the school of Tasso; and a number of short miscellaneous poems, among which those on bacchanalian scenes are the best—"The Revel" is one of the most remarkable of convivial poems. He died in Paris in 1661.

ST. ANDREWS, a town of Scotland; on a rocky plateau at the edge of St. Andrews Bay, 42 miles N. N. E. of Edinburgh. From the number and nature of the remains of ancient burials found in and around the city there can be little doubt that there was a settlement here in early prehistoric times. The monkish legend, long discredited, assigned its ecclesiastical origin to St. Regulus or Rule, who, warned in a dream, brought certain bones of St. Andrew from Patras in the 4th century, and was wrecked at Muckros, afterward called Kilrimont, now St. Andrews. There is, however, reason for believing not only that those relics were brought in the 8th century, but that, before the end of the 6th, Cainnech, or Kenneth, the patron saint of Kilkenny, had founded a monastery at Rig-Monadth, the Royal Mount, and that thus arose the name of Kilrimont. Early in the 10th century it seemingly became the seat of the high bishop of the Scotch; and in Queen Margaret's time he began to be called the Bishop of St. Andrews. The Augustinian Priory, founded in 1144, was the richest and greatest of all the religious houses of Scotland. The cathedral, founded in or about 1160, and consecrated in 1318, was stripped of its images and ornaments in 1559, and afterward fell into ruin. The extreme length inside is 355 feet, but at one time it had been several bays longer. The bishop's palace or castle, first built in 1200, was frequently demolished and rebuilt, and is now a ruin. George Wishart and other martyrs were confined in its dungeon, and Cardinal Beaton was slain within its walls. None of the ruins is less imposing or more interesting than the foundations on the Kirkhill—the site of the Celtic church. St. Rule's Tower has probably occasioned more discussion and perplexed more archæologists than any other building in Scotland. Its arches, as well as that of its roofless chapel, approach the horseshoe in form. The parish church, which was almost entirely rebuilt in 1798, was founded in 1412. Its predecessor, which stood near the cathedral, was built three centuries earlier. Of the Black Friars Monastery a portion of the chapel remains; but of the Grey Friars almost nothing. The parish church of St. Leonard's is roofless, and the congregation worships in the fine chapel of St. Salvator's. The Madras College, founded and endowed by Dr. Bell, has been remodeled and placed under a new governing body. The town was erected into a free burgh between 1144 and 1153. The manufacture of golf clubs and balls is naturally a thriving industry, St. Andrews being known all over the world as the headquarters of golf. It is a popular watering place and summer resort. Pop. about 8,000.

SAINT ANDREW'S, UNIVERSITY OF, an ancient Scottish university. The university rose out of a school founded by a colony of Scotch-Irish monks from Columcille's foundation at Iona, renewed by Bishop Wardlaw in 1411, and confirmed by a bull of Pope Benedict XIII. Like Oxford in England, it was modeled on the plan of the University of Paris and based its teaching largely on the scriptures and theology. There were three colleges in the 16th century: St. Salvator, St. Leonard, and St. Mary, and these, after the Reformation, became the strongholds of Protestantism. In 1579 the colleges were reorganized, so that theology was made the principal study at St. Mary's, while St. Salvator and St. Leonard took over the teaching of philosophy, law and medicine. University College at Dundee was affiliated with Saint Andrew's in 1890. The number of students is (1921) 830.

SAINT ARNAUD, JACQUES LEROY DE, a French marshal; born in Paris, France, in 1801. He entered the army in 1817, but left it in 1827 to take part in the Greek struggle for independence. Returning to the French army in 1831, he six years later proceeded to join the foreign legion in north Africa, and laid the foundation of his reputation in the wars against the native tribes during the next 10 years. In 1847 he was made a general

of brigade; and in the early part of 1851 he carried on a bloody but successful warfare with the Kabyles. Louis Napoleon, plotting the overthrow of the republic, was at this time on the lookout for resolute and unscrupulous accomplices; and he recalled General Saint Arnaud and appointed him to the command of the second division of the city forces. On Oct. 25 Saint Arnaud became war minister, and took an active part in the arrangements for the coup d'état of Dec. 2, and in the subsequent massacres at the barricades. For these services he was rewarded with the marshal's baton. On the breaking out of the Crimean War in 1854 he was intrusted with the command of the French forces, and co-operated with Lord Raglan in the battle of the Alma, Sept. 20. But nine days afterward he died on board ship, on his way home to France, Sept. 29, 1854.

ST. ASAPH, a cathedral city of Flintshire, North Wales, on an eminence between the Elwy and Clwyd, 6 miles S. S. E. of Rhyl. The cathedral, 182 feet long, is the smallest in the kingdom, and, rebuilt after 1284, is a plain, cruciform, red sandstone structure, mainly Decorated in style, with a massive central tower 93 feet high, fine oak stalls. It was restored by Scott in 1867–1875. St. Kentigern is said to have founded about 560 a bishopric at Llanelwy, renamed St. Asaph after his favorite disciple. St. Asaph has a grammar school, founded about 1600, and rebuilt in 1882. Pop. about 7,000.

ST. AUGUSTINE, a city, port of entry, and county-seat of St. John co., Fla.; on the Matanzas river, near the Atlantic Ocean, on the Florida and East Coast Canal and the Florida East Coast railroad; 36 miles S. of Jacksonville. It occupies a peninsula formed by the Matanzas river on the E. and the St. Sebastian river on the S. and W. Directly in front is Anastasia Island, forming a breakwater. Here are the State Institute for the Blind, Deaf, and Dumb, the Sisters of St. Joseph and St. Mary's Convents, Wilson Public Library, United States barracks, United States government building, the great Ponce de Leon, Cordova, and Alcazar hotels, and two newspapers. The chief industries are the manufacture of cigars and palmetto straw goods, dairying and the growing of agricultural and horticultural products. The city, however, is principally of importance as a winter resort. The climate is mild and equable, there being only a few days in winter when invalids cannot take regular out-door exercise. The gardens and squares are full of palmettoes, Spanish daggers, orange and citron trees, date palms, magnolia, and bananas. St. Augustine is the oldest town in the United States, a fort having been built here by the Spaniards in 1565. As early as 1512 Ponce de Leon landed near the site of the city. In 1763 it became a British possession, and during the Revolutionary War was an important military depot. Later it again passed into the hands of Spain, and was ceded to the United States in 1821. Pop. (1910) 5,494; (1920) 6,192.

ST. BARTHOLOMEW, or ST. BARTHÉLEMY, a French West Indian island, 190 miles E. of Porto Rico; area, 8 square miles. The treeless surface rises to 1,003 feet; the climate is very dry. French from 1648 till 1784, the island then was Swedish till 1877, when it was bought back by France for $55,000.

ST. BARTHOLOMEW, MASSACRE OF, a massacre of the Huguenots which took place in Paris, France, beginning on the night of August 23–24 (St. Bartholomew's day), 1572. A large number of prominent Huguenots had been invited to the royal palace to participate in the wedding festivities of Henry of Navarre. While these guests were in the palace they were slaughtered without mercy, and at a signal the massacre quickly spread over the city. The anti-Huguenot leaders were Charles IX., the queen-mother Catharine de Medici, and the Duke of Guise. It has been said that the queen-mother instigated the king to his fatal persecution of the Huguenots. Coligny was the principal victim of the St. Bartholomew massacre, probably as much for political as for religious reasons. The massacre spread over France and about 30,000 lives were lost. A religious war immediately followed. It is disputed whether the massacre was deliberately planned or was the sudden result of the discovery of Huguenot plots, though the evidence points largely to the former.

SAINT BERNARD, a city of Ohio in Hamilton co. It is on the Baltimore and Ohio Southwestern, the Cleveland, Cincinnati, Chicago, and St. Louis, and the Norfolk and Western railroads, and on the Miami and Erie Canal. It is a suburb of Cincinnati. Its chief industries are soap factories and fertilizer plants. Pop. (1910) 5,002; (1920) 6,312.

ST. BERNARD, the name of two mountain passes in the Alps. (1) GREAT ST. BERNARD is on the road between Aosta in Piedmont and Martigny in the Swiss canton of Valais, and is 8,120 feet above sea-level. Almost on its crest stands the celebrated hospice founded in 962 by Bernard de Menthon, a neighboring nobleman, for the benefit of pilgrims journey-

ing to Rome. It now affords sleeping accommodations for 80 travelers, and can give shelter to about 300 in all. The hospice is connected with a station in the valley below, from which the monks above are warned by telephone when travelers are on their way up the mountain. The keepers of the hospice are a dozen or so of Augustinian monks, all young and strong; their work is, with the aid of large dogs, to rescue travelers who are in danger of perishing from the snow and cold. But the dogs they use are no longer the famous St. Bernard breed, but Newfoundlands. In 1889 a botanical garden, chiefly for Alpine plants, was laid out in the Entremontthal, on the N. slope of the pass. Diggings in 1890 revealed the foundation of a small Roman temple of imperial times near the summit of the pass, with a few bronzes and other antiques. (2) LITTLE ST. BERNARD, S. W. of the above in the Graian Alps, connects the valley of Aosta with that of Tarantaise in Savoy. By this pass Hannibal is believed to have led his forces into Italy. It, too, has a hospice, 7,143 feet above the sea.

ST. BERNARD, a breed of dogs which derives its name from the hospice of St. Bernard, where it was first introduced for the purpose of finding the pass across the mountain in snow.

The St. Bernard, according to the traditions of the monastery, is the result of a cross between a Danish bull-bitch and a mastiff, a native hill dog, though at what time effected it is impossible to say. After the breed was once established it was kept pure till 1812. About 1860 these dogs first attracted the attention of English travelers, who imported them to Great Britain, where they were exhibited and at once excited much notice on account of their size and beauty. Others were introduced, and the St. Bernard was soon established as the most popular big dog, a popularity which has gone on increasing. The St. Bernard, as bred to modern English ideas, is an immense red or orange colored dog, marked with white on muzzle, neck, chest, feet, and tip of tail.

ST. CATHARINES, a city and capital of Lincoln co., Ont., Canada; on the Welland canal, and the Welland, the Niagara Central, and the Grand Trunk railroads; 12 miles N. W. of Niagara Falls. Here are a Collegiate Institute, Bishop Ridley College, a convent, numerous churches, General and Marine Hospitals, waterworks, gas and electric lights, celebrated mineral springs, several branch banks, and a number of daily and weekly newspapers. St. Catharines is the center of the fruit trade of Ontario. It has numerous canning factories, flour mills, machine shops, planing mills, breweries, woolen mills, wheel works, tanneries, hair cloth factories, etc. Pop. about 20,000.

SAINT CATHARINE'S COLLEGE, a college of Cambridge University, founded in 1473. It is one of the smaller Cambridge colleges, having about 30 scholars.

ST. CHARLES, a city and county-seat of St. Charles co., Mo.; on the Missouri river, the Wabash, and the Missouri, Kansas, and Texas railroads; 22 miles W. of St. Louis. It contains Lindenwood Female College, St. Charles College (M. E. S.), the Convent of the Sacred Heart, electric lights, St. Charles Borromeo and St. Charles Libraries, National and savings banks, and a number of daily and weekly newspapers. An iron railroad and highway bridge, built at a cost of $1,750,000, crosses the river here. In the vicinity are several quarries of limestone. The city has a woolen factory, a large bridge-building plant, flour mills, manufactures of railroad cars, etc. Pop. (1910) 9,437; (1920) 8,503.

ST. CHRISTOPHER. See KITT'S, ST.

SAINT CLAIR, a borough of Pennsylvania, in Schuylkill co. It is on the Pennsylvania and the Philadelphia and Reading railroads. It is the center of an important anthracite coal region and coal mining is the leading industry. Pop. (1910) 5,640; (1920) 6,585.

ST. CLAIR, a lake in North America, between Lake Huron and Lake Erie, and connected with the former by St. Clair river, with the latter by Detroit river. It is 30 miles long, greatest breadth 24 miles, area 360 square miles. It contains several fine islands. The river St. Clair, which separates Canada and the United States, is about 40 miles long, 1 mile wide, and navigable.

SAINT CLAIR RIVER, a river forming the boundary between Michigan and Ontario, the outlet of Lake Huron. It empties into Lake St. Clair. The river is navigable and a canal has been dug through one of its channels, forming the St. Clair Flats Canal. A tunnel underneath the river between Port Huron and Sarnia connects the Canadian Grand Trunk and the Chicago and Grand Trunk railways.

ST. CLAIR, ARTHUR, an American military officer; born in Thurso, Scotland, in 1734. He was at Louisburg in 1758 and Quebec in 1759; engaged in the battles of Trenton and Princeton; was in command in 1777 at Ticonderoga, which Burgoyne forced him to evacuate; was at the battle of Yorktown; president of Con-

gress in 1787; governor of Northwest Territory in 1789–1802. The expeditionary force against the Miami Indians, numbering 1,400, commanded by him, was cut to pieces near Miami village in 1791. He resigned his command in 1792; published an account of the Miami expedition in 1812; and died near Greensburg, Pa., August 31, 1818.

ST. CLOUD, a city and county-seat of Stearns co., Minn.; on the Mississippi river, and on the Northern Pacific, and the Great Northern railroads; 75 miles N. W. of St. Paul. It contains the Minnesota State Reformatory, a State Normal School, hospital, public library, waterworks, street railroad and electric light plants, National and private banks, and daily newspapers. It has novelty works, manufactures of lumber and wagons, flour mills, foundry, several granite quarries, the Great Northern railroad car shops, and large grain interests. Pop. (1910) 10,600; (1920) 15,873.

ST. CLOUD, a town of France, in the department of Seine-et-Oise; on an eminence near the Seine, 5 miles W. of Paris. Henry III. was assassinated here in 1589 by the fanatical monk Jacques Clément. St. Cloud was long famous on account of its magnificent château, built by Louis XIV.'s brother, the Duke of Orleans. Napoleon planned and carried out here the coup of 18th Brumaire, and after he became emperor made this château his favorite place of residence. It was destroyed, and its magnificent park (in which stands the Sèvres porcelain factory), greatly injured, during the siege of Paris in 1870. Pop. about 6,000.

ST. CROIX, an American river, called also the Passamaquoddy and the Schoodic, which, flowing out of Grand Lake, on the E. border of Maine, runs S. E. 75 miles to Passamaquoddy Bay, and forms a portion of the boundary between the United States and New Brunswick.

ST. CROIX, a West Indian island, formerly belonging to Denmark; purchased by the United States in 1916 and now one of the Virgin Islands. Area, 74 square miles; pop. about 20,000. Pop. of Fredericksted, chief town, 3,000. The W. portion is hilly, but the soil almost throughout the island is productive. Sugar is the principal crop, which is, however, diminishing. The island was discovered by Columbus.

ST. CUTHBERT, an English bishop; born near Melrose, England; early in the 7th century. He was successively prior of the monasteries of Melrose and Lindisfarne, retired afterward to the lone and desolate isle of Farne, where he might enjoy a life of solitude. He finally yielded to the persuasion of the Northumbrian king, Oswy, and took the bishopric of the province of Lindisfarne. He held this office for two years, when, worn out by labors and austerities, he died on the island of Farne, March 20, 687, which day is observed for his festival.

ST. CYRIL OF ALEXANDRIA, an Egyptian bishop; born in Alexandria, Egypt, about 376. He succeeded his uncle Theophilus as Bishop of Alexandria in 412. He compelled the Novatians to silence, banished the Jews, and caused Nestorius to be condemned and deposed by the Council of Ephesus. A subsequent *ex parte* council of 42 bishops, headed by John, patriarch of Antioch, and favoring Nestorius, excommunicated and deposed his opponent. The emperor, appealed to in this strait, condemned both sides, and ordered the rival champions to be imprisoned. The powerful intercession of Rome, however, caused this sentence against Cyril to be abrogated. His works, mostly controversial, have been published, Paris, 1638, in seven volumes, folio. He died in Alexandria in June, 444.

ST. CYRIL OF JERUSALEM, a Church father; born in or near Jerusalem, Palestine, about 315. He was elected bishop of his native city in 351. He was soon engaged in hot conflict with his metropolitan, the Arian bishop Acacius of Cæsarea, who caused him to be twice deposed. He was for the second time restored to his episcopate in 360. Soon after, his old enemy Acacius died, but Cyril was immediately involved in new difficulties. After considerable strife Cyril was banished by order of the Emperor Valens in 367; nor did he return till the emperor's death in 378. His writings, mostly doctrinal, are extremely valuable. They present to us, in a more complete and systematic manner than the writings of any other father, the creed of the Church. He died in 386.

ST. DAVID. See DAVID I.

ST. DAVID, FORT, a ruined defensive work on the coast of Madras presidency, British India; 100 miles S. of Madras, on the outskirts of Cuddalore. It became British in 1690, along with all the land round about to the distance of a "randome shott," and was an important place during the struggle with the French, forming the chief of the English settlements on the Coromandel coast from 1746 to 1752. It is of interest also from association with Clive, who became governor in 1756.

ST. DAVIDS, a village in Pembrokeshire, South Wales, on the rivulet Alan, within 1½ miles of St. Brides Bay and 16

miles W. N. W. of Haverford-West station. The ancient Menevia, it is now a very small place; but in the Middle Ages its cathedral, with the shrine of its founder, St. David, the patron saint of Wales, attracted many pilgrims, among them the Conqueror, Henry II., Edward I. and Queen Eleanor. Rebuilt between 1180 and 1522 that cathedral is a cruciform pile, measuring 298 feet by 120 across the transepts, with a central tower 116 feet high. Special features are the base of St. David's shrine, the tomb of Edmund Tudor, Henry VII.'s father, and the mosaics by Salviati. Little is known of the British bishops after St. David's death in 601; of the 72 since 1115 may be mentioned Archbishops Thoresby and Chichely, Barlow, Ferrar the Marian martyr, Middleton the forger, Archbishop Laud, Mainwaring, Bull, Lowth, Horsley, and Thirlwall. N. of the cathedral is the ruined college of St. Mary (1377), with a slender tower 70 feet high; and across the Alan are the stately remains of Bishop Gower's palace (1342).

ST. DENIS. See DENIS, ST.

ST. DIÉ, a town of France, department of the Vosges; on the Meurthe, 50 miles S. E. of Nancy. It has a Romanesque-Gothic cathedral, a large seminary, and a museum, and carries on energetically the weaving of cotton, the making of hosiery, paper, machinery, and iron goods. It is a convenient starting-point for excursions into the Vosges mountains. Pop. about 22,000.

ST. DOMINGO. See SANTO DOMINGO.

ST. DOMINIC. See DOMINIC, SAINT.

SAINTE ANNE DE BEAUPRÉ, a village of Quebec, Canada, in Montmorency co., at the junction of the Ste. Anne and the St. Lawrence rivers. It is chiefly noted for the church of Ste. Anne, containing relics of Ste. Anne which are alleged to have miraculous powers. Thousands of pilgrims visit the shrine annually. Ste. Anne was founded about 1620 and the first church was erected in 1658. It was restored in 1878 and still remains. Several picturesque falls are in the neighborhood. Pop. about 2,000.

SAINTE-BEUVE, CHARLES AUGUSTIN, a French writer, and one of the greatest of modern critics; born in Boulogne, France, in 1804. He studied medicine at Paris, but abandoned that science in favor of literature, his first work of importance being on the French literature of the 16th century. In 1837 he delivered some lectures in the School of Port Royal at Lausanne, and these laid the foundation of his elaborate work, "History of Port Royal." In 1840 he was appointed conservator of the Mazarin Library, and in 1845 admitted a member of the French Academy. After 1848 he contributed a number of critiques to the Monday numbers of the "Constitutionnel" and then of the "Moniteur" ("Monday Talks," 15 vols.; "New Mondays," 13 vols.). In 1852 he was appointed Professor of Latin Poetry in the College of France, but his views in favor of Napoleon III. and imperialism rendered him unacceptable to a large section of the students, and he resigned; he also lectured for some years on French literature at the École Normale Supérieure. The cross of the Legion of Honor was bestowed on him in 1859, and the senatorship in 1865. Most of his critical writings have been republished in various editions. He also wrote three volumes of poetry (1829–1837), under the pseudonym "Joseph Delorme," but these do not rank high. He died in Paris in 1869.

ST. ELIAS, MOUNT. See ELIAS, SAINT.

ST. ELIZABETH. See ELIZABETH, SAINT.

ST. ELMO'S FIRE, a peculiar electrical phenomenon. Just preceding a storm the atmosphere often becomes charged with electricity which flows from the clouds. This makes itself visible in small, brush-like flames appearing on the sharp edges or points of different bodies. At sea, where it is a very common occurrence, it has been regarded by sailors with superstitious awe and dread from the earliest times. The Romans called the lights Castor and Pollux. If one appeared, they said it was an omen of danger; if two, it was an assurance of safety. Italian mariners of the Middle Ages regarded the light as a luminous emanation from the body of Christ, and the appearance is still called by the Portuguese Corpo Santo. In an account of the second voyage of Columbus they are described. Fournier, a writer of the 17th century, says the light was named after a saint, familiarly known as Saint Telme, but who was San Pedro Gonzales de Tuy, in Galicia, who had been a mariner, then was canonized, and became a patron saint of sailors. Galician sailors called the light San Pedro Gonzales. The phenomenon also has been known by the name of St. Hermes, St. Ermyn, St. Helen, St. Nicholas, St. Peter, St. Anne, or, indeed, by that of any one of a hundred other saints.

ST. ÉTIENNE, one of the most important industrial towns in France, in the department of Loire, on a tributary of the Loire, 36 miles S. W. of Lyons and 312 S. S. E. of Paris. It is built in the midst of the second largest coal field of France.

The town has a school of mines (1816), a national small arms factory (1764), a gallery of art, an artillery and a commercial museum. The chief industries are in iron and steel and in ribbons. Besides these branches of industry, hats, pottery, and hemp cables are made. The coal mines began to be worked in the 14th century, but only on an extensive scale in the end of the 18th. The town was twice captured by the Huguenots, in 1563 and 1570, and between this last date and 1629 it suffered terribly on three occasions from the plague. The first railways in France were built from St. Etienne, one in 1828 to Andrezieu, the other in 1831 to Lyons. Pop. about 149,000.

ST. FRANCIS, a river of the United States, forming part of the boundary between Arkansas and Missouri, and entering the Mississippi. At high water it is navigable for about 150 miles; total length 450.

ST. FRANCIS DE SALES. See FRANCIS DE SALES, ST.

ST. FRANCIS OF PAOLA. See FRANCESCO DI PAULA.

ST. FRANCIS XAVIER, a Roman Catholic educational institution, formerly the College of St. Francis Xavier, but now a high school. The college department was transferred to Brooklyn College, Brooklyn, N. Y., in 1913, which gives degrees under the title of the College of St. Francis Xavier, N. Y. The high school has a library of about 130,000 volumes, and has about 400 students and 17 instructors. President, Thomas Fell, Ph.D.

ST. GALL, the capital of the Swiss canton of the same name; on the Steinach; 2,196 feet above sea-level (the highest town in Europe), 53 miles E. of Zurich, and 9 from Rorschach on the Lake of Constance. The buildings of its famous Benedictine monastery are now used as government offices and schools, and for housing the monastic library, founded in 830, of 41,700 volumes and 1,800 MSS., several of these last of great antiquity and value. Other buildings are the old abbey church, thoroughly restored in 1756–1766, and made a cathedral in 1846; the Protestant Church of St. Lawrence (restored 1851–1853); the town library, founded in 1536; and the museum with collections of natural history, works of art, and antiquities. The city carries on a large trade in its staple commodity, embroidered textiles (cotton, muslin, etc.), and in agricultural products. The original nucleus of the place was the cell of St. Gall (about 550–645), an Irish follower of St. Columban, who settled here in 614. Around this soon grew up a monastery of the Benedictine order, which was promoted by Charles Martel to the dignity of an abbey. The abbey gradually became one of the masterpieces of mediæval architecture; while the monks were indefatigable in the collection and transcription of MSS.—Biblical, patristic, historical (sacred and profane, classical, liturgical, and legendary). Several of the classics, especially Quintilian, Silius Italicus, and Ammianus Marcellinus, have been preserved solely through the MSS. of St. Gall. Its monastic schools enjoyed the greatest reputation for learning from the 9th to the 12th century. In 1454 the town was admitted to the Swiss confederation, and in 1528, through the influence of the reformer Vadianus, it embraced the new doctrines. At the close, however, of the religious war, in 1531, the Catholic religion was re-established, and the abbot reinstated. At the French Revolution the abbey was secularized (1798), and its revenues were soon afterward sequestrated (1805). By a later arrangement (1836) St. Gall was erected into a bishopric. The French republicans created the canton of Säntis out of the town and abbey lands, with others, in 1799; and in 1803 the existing canton of St. Gall was formed. Pop. of canton (1920) 294,028; of city (1920) 69,733.

SAINT GAUDENS, AUGUSTUS, an American sculptor; born in Dublin, Ireland, March 1, 1848; came to the United States in infancy; studied art at Cooper Institute, New York City, in 1861; at the National Academy of Design in 1865–1866, and at Paris, where he attended the École des Beaux Arts in 1867. In 1871, while in Rome he produced his first figure, "Hiawatha," but returned to the United States in 1873. Among his works are the bas-relief, "Adoration of the Cross by Angels," statues of Admiral D. G. Farragut; Robert R. Randall, and President Lincoln; the Shaw monument in Boston, and the original Diana on the Madison Square Garden, N. Y. He assisted John La Farge in the decoration of Trinity Church, Boston, and in the modeling of the statue of Le Roy King, in Newport, R. I. He designed the Medal of Award of the Columbian Exposition, and a number of presentation medals authorized by Congress. He received a medal of honor at Buffalo in 1901. He died Aug. 3, 1907.

ST. GENEVIÈVE. See GENEVIÈVE, ST.

ST. GEORGE. See GEORGE, ST.

ST. GEORGE'S CHANNEL. See GEORGE'S CHANNEL, ST.

ST. GERMAIN-DES-PRÉS, named from Germanus; was a famous Benedic-

tine monastery near Paris. Its church (1001–1163) ranks as the oldest in that city.

ST. GERMAIN-EN-LAYE. See GERMAIN-EN LAYE, ST.

ST. GOAR, a fortified town of Prussia, 15 miles from Coblentz. It is on the W. bank of the Rhine, under the stupendous rock and castle of Rheinfels, with which it surrendered to the French in 1794. On the opposite side of the river is the smaller town of St. Goarshausen, and on a mountain near it is the strong castle called Katz. St. Goar has a considerable trade in wines and hides. At the end of the World War American troops occupied the town in accordance with the armistice terms.

ST. GOTTHARD, a mountain knot of the Alps, in the Swiss cantons of Uri, Grisons, Ticino, and Valais, 9,850 feet high. In its arms it holds the sources of the Rhine, Rhône, Ticino, Reuss rivers, and so sends the water from its melted snows to the German Ocean, the Mediterranean, and the Adriatic. On its shoulder it bears one of the most celebrated of the Alpine passes from Switzerland to Italy. The road that crosses this pass (6,936 feet) leads from the shores of Lake Lucerne to the shores of Lago Maggiore. This route was first used by the Longobardi in the 6th century. Since 1882, a railway has climbed up the lower slopes of the St. Gotthard, and then burrowed through it in a tunnel. The making of this tunnel was begun in 1872 and finished in 1880; it extends from Göschenen (at a height of 3,639 feet) in Uri to Airolo (3,757 feet) in Ticino, measures 9¼ miles in length, is 26 feet wide, and 21 high, rises with a gradient that reaches on an average 26 in 100 feet, and cost $11,350,000 to make. The total cost of the St. Gotthard railway was $45,400,000. The line has proved very successful financially.

ST. GREGORY. See GREGORY, ST.

ST. HELENA, a lonely island in the Atlantic, 1,200 miles from the W. coast of Africa; length, 10 miles; width, 8 miles; area, 47 square miles. Pop. about 3,750. It is part of an old volcano and reaches 2,823 feet in High Hill. Its shores are perpendicular cliffs 600 to 2,000 feet high, and are in many places cleft by deep, narrow valleys. The climate is pretty constant and generally healthy. Whale-fishing and the growing of potatoes are the principal occupations of the inhabitants. Previous to the cutting of the Suez Canal St. Helena was a favorite port of call for vessels bound to and from India by the Cape of Good Hope, and the inhabitants did a large trade in furnishing these vessels with provisions and other supplies. But the shorter route afforded by the canal and the Red Sea has entirely destroyed this trade, and the island is speedily going from bad to worse. At Jamestown, the capital, a detachment of Royal Marines is stationed. St. Helena was discovered by the Portuguese in 1502, and taken possession of by the British East India Company in 1651. They remained masters of the island down to 1834; since that time it has been administered by a governor and an executive council of four members. The island is chiefly celebrated as the place of Napoleon Bonaparte's imprisonment from 1815 to his death in 1821. His home was the farmhouse of Longwood, 3 miles inland from Jamestown; and the spot where he was first buried lies about 1 mile to the S. W.

ST. HELENS, a town of Lancashire, England, on the Sankey brook; 14 miles E. N. E. of Liverpool and 21 W. by S. of Manchester. Thanks to its railway and canal facilities, and to the immediate neighborhood of coal, it has grown from a small village to an important industrial center, and now is the great seat of the manufacture of crown, plate, and sheet glass, and also possesses extensive alkali, copper smelting, and iron works. It was constituted a municipal borough in 1868; a parliamentary borough in 1885; and a county borough in 1888. The handsome town hall, with a public library, was opened in 1876. Pop. (1919) 105,009.

ST. HELEN'S MOUNTAIN, a volcanic peak of the Cascade range, at the N. W. angle of Skamania co., Wash.; height, about 13,400 feet.

ST. HELIER, the capital of the island of Jersey; on the S. shore of the island, and the E. side of St. Aubin's Bay. It is defended by Elizabeth Castle (1551–1586), on a rocky island off the shore, approached by a causeway at low water; and by Fort Regent, on the S. E. side of the town; built in 1806–1815 on a scarped granite rock, at a cost of $5,000,000. Victoria college (1852) is a handsome edifice; and one may also notice the court house (1647), the public library (1736), a gilt statue of George II. (1751), and the harbor, forming an outer and inner basin. An active trade is carried on with England, France, and India. Pop. about 30,000. See JERSEY.

SAINT-HILAIRE, AUGUSTIN FRANÇOIS CÉSAR PROUVENÇAL DE, called AUGUSTE DE SAINT-HILAIRE, a French botanist; born in Orléans, France, Oct. 4, 1799; wrote: "Flora of Southern

Brazil," and a series of four works, which included his travels, under the general title of "Journey in the Interior of Brazil," and issued in eight volumes, at intervals from 1830 till 1851. He traveled extensively in the S. and interior provinces of Brazil from 1816 till 1822. He died in Orléans, Sept. 30, 1853.

ST. IVES, a seaport and watering place in England, on St. Ives Bay, on the N. coast of Cornwall; 57 miles W. S. W. of Plymouth. It is a popular winter resort, has an extensive pilchard fishery, and exports large quantities of tin, copper, and slate. Its harbor is protected by a pier built in 1770. It has beautiful churches and chapels, a custom house, and other public buildings, including a literary institution. Pop. about 7,000.

ST. JAMES'S PALACE, a palace in London, England. Originally a hospital dedicated to St. James, it was reconstructed and made a manor by Henry VIII., who also annexed to it a park, which he inclosed with a brick wall, to connect St. James's with Whitehall. The gateway and clock tower are from designs by Holbein. Here Queen Mary died (1558); Charles I. slept here the night before his execution; and here Charles II., the Old Pretender, and George IV. were born. When Whitehall was burned in 1697, St. James's became the regular London residence of the British sovereigns, and it continued to be so till Queen Victoria's time. Additions and improvements, gradually made, have totally changed the original palace, so that at the present time little, if any, of the old structure remains. In 1837 the royal household was transferred to Buckingham Palace, whither the drawing rooms were also removed at the death of the prince consort, and St. James's was used only for levees. The Court of St. James's is a frequent designation of the British court. St. James's Park lies S. of the palace, and extends over 93 acres.

ST. JOHN, a city, seaport, and capital of St. John co., province of New Brunswick, Canada, on the St. John river, at its entrance into the Bay of Fundy, and on the Intercolonial, the New Brunswick Southern, and the Canadian Pacific railroads, 481 miles E. of Montreal. It has an excellent harbor, protected by a breakwater 2,250 feet long. The tides here rise and fall from 25 to 35 feet every day. The city is built on rising ground, the elevated portion consisting wholly of solid rock, which in numerous places has been excavated to a considerable depth for new streets. Here are churches representing all of the principal denominations, and excellent schools. The public buildings include the post office, custom house, Odd Fellows' and Masonic Halls, Free Public Library, Mechanics' Institute, Provincial Insane Asylum, City Hospital, Sailors' Home, Home for Aged Females, Reformatory for Boys, Wiggin's Orphan Asylum for Sons of Seamen, Protestant and Roman Catholic orphan asylums, and the Dominion Savings Bank. St. John has large business interests. The principal industries include the manufacture of carriages, paint, sashes and doors, lead pipe, engines and boilers, nuts and bolts, furniture, nails, rolled iron, cotton goods, and lumber. The foreign trade is also very extensive, as the city is the shipping point of a rich agricultural, timber, and mineral region. In 1604 the site of St. John was visited by M. de Monts, and in 1635 Charles de la Tour erected a fort here. In 1735 the place became a British possession by the treaty of Utrecht. In the same year it was colonized by American royalists, and two years later was chartered as a city. Pop about 61,500.

ST. JOHN, the largest river of New Brunswick, rising in the highlands in the N. of Maine, flowing N. E., and then S. E. 450 miles, and falling into the Bay of Fundy by an estuary 5 miles in width. Near the sea it is navigable for large vessels; while for craft of 120 tons it is practicable as far as Fredericton (86 miles), and for small steamers to Woodstock, 75 further up. Through most of its upper course the stream separates Maine from Canada.

ST. JOHN. See JOHN, ST.

ST. JOHN LATERAN, CHURCH OF. See LATERAN, CHURCH OF ST. JOHN.

ST. JOHN'S, a city, capital of Newfoundland, and the extreme eastern seaport of North America; 1,076 miles N. E. of Montreal and 1,665 miles W. by S. of Galway, Ireland, the shortest distance between any two seaports of America and Europe. It is on the Atlantic Ocean and the Newfoundland railway. The city is built on an acclivity. It has an excellent harbor, affording perfect shelter for vessels and having a drydock at its head, 600 feet long. The entrance to the harbor is called the Narrows, and is about 600 feet wide at the narrowest point. To the N. of the Narrows is Signal Hill at which place Marconi received the first trans-Atlantic wireless telegraph message, 510 feet above sea-level, and to the S. South Side Hill, nearly 650 feet. At the foot of the latter is Fort Amherst lighthouse. The city has numerous churches, of which St. John's Cathedral (R. C.), and the Anglican Cathedral, one of the most beautiful specimens of Gothic archi-

tecture in British America, are the most noteworthy. The institutions for higher education include Anglican, Methodist, Presbyterian, and Roman Catholic Colleges. Here also are several literary institutes, libraries, Government House, House of Assembly, Poorhouse, Penitentiary, Hospital, and several banks and public halls. The city has a number of foundries, tanneries, breweries, cabinet factories, biscuit factories, oil refineries, a net factory, boot and shoe plant, rope walk, nail factory, and gas works. There is a large trade in supplying fishermen for the cod and seal fisheries with fishing gear, clothing, and provisions. The city was visited by a disastrous fire in 1892, causing a total loss of $16,000,000. A water power generating plant at Petty Harbor, 8 miles distant, supplies the city with electricity for all purposes. Pop. (1918) 34,045.

ST. JOHNSBURY, a town and county seat of Caledonia co., Vt.; on the Passumpsic river, and on the Portland and Ogdensburg, the Passumpsic, and the St. Johnsbury and Lake Champlain railroads; 34 miles E. N. E. of Montpelier. It contains a fine court house, St. Johnsbury Academy, St. Johnsbury Atheneum, waterworks, street railroad and electric light plants, National and savings banks, and two newspapers. It has foundries, machine shops, manufactories of farming implements, and scale works. Pop. (1910) 6,693; (1920) 7,163.

SAINT JOHN'S COLLEGE, a college of Cambridge University, founded in 1511. It ranks second among the Cambridge colleges in size and importance. It has about 250 undergraduates. The library contains about 40,000 volumes.

ST. JOHN'S RIVER, the chief river of Florida. It has its rise in the swamp regions of Brevard and Osceola counties and flows in a northerly direction, roughly parallel with the coast line, emptying into the Atlantic Ocean 25 miles S. of the Georgia boundary. From its source it passes through a chain of lakes, the largest of which is Lake George. At this point it expands into the form of a lagoon from 1 to 5 miles wide. The river has been dredged to a depth of 18 feet to Jacksonville, and to a depth of 8 feet to Lake George. It is navigable to small steamers as far as Enterprise, 230 miles from its mouth.

SAINT JOHN THE DIVINE, CATHEDRAL OF, Protestant Episcopal Cathedral of the diocese of New York. It is situated on the elevation in the N. part of Manhattan Island called Morningside Heights and overlooks the upper E. part of the city. The project for its erection began in 1872, but first took a practical turn in 1889 when Bishop Potter invited designs from architects, that of La Farge and Heins being accepted. This design, having as important elements a mixture of the Byzantine and Romanesque, has been subjected to considerable modification in the actual working out. In 1899 the crypt was completed, and in 1915 the final touches were given to the choir, chancel, and chapels, and the domed roof made a stately impression. There are seven chapels of St. Saviour, St. Columcille, St. Ambrose, St. Martin of Tours, St. Boniface, St. James, and St. Ansgarius. The half dome of the apse is supported by six large columns of granite from Hurricane Island, Me. The structure measures 360 feet as it stands; the chancel is 50 feet wide and 130 feet high. When completed, the cathedral will be 600 feet long with transepts having a total breadth of 300 feet. The cost in 1915 had been $3,615,000.

ST. JOHN'S WORT (*Hypericum*), the typical genus of plants of the natural order *Hypericineæ*. It is a numerous genus of herbs and shrubs widely distributed, both in the New and Old World, particularly abundant in Western Asia, Southern Europe, and in North America; it occurs also within the tropics. The leaves are opposite entire, without stipules, often marked with glandular dots of two kinds, pellucid ones which are very apparent when the leaves are held against the light, and black ones which are usually on the under side of the leaves round the edge, or sometimes on the flowers. The flowers are regular, with five sepals, and five petals, usually yellow. They abound in a yellow resinous juice which is more or less purgative and anthelmintic. The leaves of *H. androsæmium* are called by the French *toute saine*, hence the English name tutsan; in both countries they were formerly used to dress fresh wounds. Other species of Hypericum have similar properties. There are several species, such as *H. calycinum* (also called Aaron's Beard), frequently cultivated in British gardens.

SAINT JOSEPH, a city of Michigan in Berrien co. It is at the mouth of the St. Joseph river, on Lake Michigan and on the Père Marquette, the Michigan Central, and the Interurban railroads. It is connected with Chicago by steamboat lines. Its favorable location makes it a favorite summer resort. It has an excellent beach, a public library, and a park. Its industries include the manufacture of iron, paper, boats, engines, automobile

tubes, flour, etc. Pop. (1910) 5,936; (1920) 7,251.

ST. JOSEPH, a city and county-seat of Buchanan co., Mo.; on the Missouri river, and on the Burlington Route, the Atchison, Topeka, and Santa Fé, the Chicago Great Western, the Missouri Pacific, the Chicago, Rock Island, and Pacific, the St. Joseph and Grand Island, and the Kansas City, Clay County and St. Joseph railroads; 60 miles N. W. of Kansas City. It is the third city in the State in population and is one of the wealthiest cities of its size in the United States.

Business Interests.—St. Joseph has upward of 300 manufacturing establishments. The chief manufactures are clothing, shirts, overalls, flour, and grist mill products, boots and shoes, furniture, machinery, packed meat, and woolen blankets. The city is the trade center of a large and rich agricultural region, with which it has a large jobbing trade. It is also an important shipping point for cattle, hogs, and grain, and one of the greatest live stock markets in the country. There are several National and private banks, and numerous daily, weekly, and monthly periodicals. The assessed property valuation exceeds $50,000,000, and the total bonded debt is about $600,000.

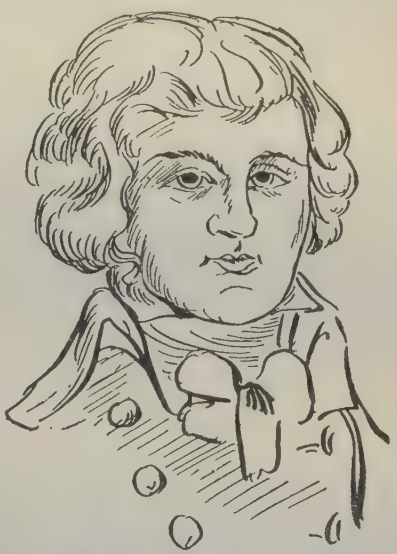
Public Interests.—The city has an area of 13.87 square miles. The sewer system covers the entire city, and the streets are lighted by electricity. There is a public school enrollment of over 12,000 pupils. Here are the Ensworth and Central Medical Colleges, College of St. Joseph (nonsect.), Academy of the Sacred Heart (R. C.), the State Lunatic Asylum, St. Joseph's Hospital, Ensworth Hospital, public library, waterworks, and street railroads.

History.—The city was established by Joseph Robidoux in 1843; incorporated as a town in 1845; and chartered as a city in 1885. After the discovery of gold in California it became prominent as the starting-point for mining parties on their way across the prairies. During the Civil War it was fortified by the Federals. Pop. (1910) 77,403; (1920) 77,939.

ST. JOSEPH, a river in Michigan whose course is in Hillsdale co., and which flows into Lake Michigan at St. Joseph. Its course is very winding and nearly W. and N., curving through Elkhart co., Ind., and touching South Bend, and a few miles below that city returning to Michigan, and then flowing N. through Berrien co. It is navigable to South Bend and is 250 miles long. Another river of the same name is in southern Michigan and passes across a part of northwestern Ohio and northeastern Indiana, uniting at Fort Wayne with St. Mary's river and so forming the Maumee. Its length is about 100 miles.

ST. JOSEPH ISLAND, an island in the outlet of Lake Superior into Lake Huron. It belongs to Ontario, Canada, is 20 miles long, 15 miles wide.

SAINT-JUST, ANTOINE LOUIS LÉON FLORELLE DE, a French revolutionist; born in 1767. He adopted with enthusiasm the principles of the Revolution, became the right hand of Robespierre, and was one of the most energetic



ANTOINE L. L. F. DE SAINT-JUST

and resolute members of the Mountain party. He was an effective speaker, but unscrupulous and uncompromising. The guillotine was his general answer to all arguments and actions which did not harmonize with his own. He fell with Robespierre through the events of the 9th Thermidor (July 27, 1794), and perished on the same scaffold with him on the following day, July 28, 1794.

ST. LAWRENCE, a river of North America, forming in its upper reaches part of the N. boundary of the United States, but for the most part confined to the Canadian Dominion. It issues from Lake Ontario at Kingston, where the name begins to be applied to the river, though the remotest source of the highest feeder of its basin, the St. Louis, which enters the W. end of Lake Superior, is in the N. E. of Minnesota. Passing

through the chain of Great Lakes on leaving Lake Ontario, it flows N. E., first through the beautiful district known as the Thousand Isles, from the number of islands large and small (in all about 1,500), which here vary its course, and then forms the wide expanses called Lakes St. Francis (just after quitting the United States boundary), St. Louis (just above Montreal Island), and St. Peter (a little above Three Rivers, between Montreal and Quebec). Below Quebec it forms a broad estuary, and it enters the Gulf of St. Lawrence by a mouth 26 miles wide, between Point des Monts (Saguenay) and the Gaspé Peninsula. Length from Lake Ontario to the Gulf 760 miles, to the W. point of Anticosti 1,034 miles. The height of Lake Ontario above sea-level is 246.6 feet of which the river descends 206.75 feet in the 348 miles above Montreal. Below Montreal accordingly, the total fall is about 40 feet, or about 1 foot in 10 miles, a rate presenting no difficulty for navigation; and since the construction of a ship canal, 27½ feet deep, through Lake St. Peter, the largest merchant vessels afloat have been able to reach that city in summer. In the stretches above Montreal the fall of the river-bed takes place in a succession of rapids, to avoid which canals have been constructed. These are in the ascending order the Lachine Canal, 8½ miles long, with 5 locks, and a rise of 45 feet; Beauharnois Canal, 11¼ miles long, with 9 locks, and a rise of 82½ feet; Cornwall Canal, 11 miles long, with 6 locks, and a rise of 48 feet; Farran's Point Canal, ¾ miles long, with 1 lock, and a rise of 4 feet; Rapide Plat, 4 miles long, with 2 locks, and a rise of 11½ feet; and Galops Canal, 7⅝ miles long, with 3 locks, and a rise of 15¾ feet. The basin of the St. Lawrence is estimated to contain 297,000 square miles, of which 95,000 are covered with the waters of the Great Lakes.

ST. LAWRENCE, CAPE, the N. projection of Cape Breton Island which is a part of the province of Nova Scotia. It is about 100 miles long.

ST. LAWRENCE, GULF OF. See GULF OF ST. LAWRENCE.

ST. LAWRENCE ISLAND, an island in Bering Sea which belongs to Alaska. It is inhabited by Eskimo. It is 100 miles long, 35 miles wide, and its altitude is 492 feet.

ST. LAWRENCE UNIVERSITY, a coeducational institution in Canton, N. Y.; founded in 1858 under the auspices of the Universalist Church; reported at the close of 1919: Professors and instructors, 58; students, 645; president, R. E. Sykes, D.D.

ST. LOUIS, a port of entry, and chief city of Missouri; on the W. bank of the Mississippi river, 20 miles S. of the mouth of the Missouri. It is the sixth city in the United States in population, and the commercial metropolis of the Mississippi valley. The city is built on rising ground, comprising three terraces, the highest of which is 200 feet above the level of the river; area, 61 square miles; pop. (1910) 687,029; (1920) 772,897.

Municipal Improvements.—The city owns an extensive waterworks system, with an average daily consumption of 101,810,000 gallons, erected at a cost of $33,000,000. The water is distributed through 1,040 miles of mains. There are in all 1,048 miles of streets, of which 947 miles are paved. The streets are lighted by gas and electricity at an annual cost of about $600,000. The average cost of the police department exceeds $2,411,000 per annum, and that of the fire department $1,308,300. The annual cost of maintaining the city government is about $17,900,000. The annual death rate averages 16.76 per 1,000.

Public Parks.—St. Louis has a park system which constitutes one of its most attractive features. There are 70 parks and playgrounds, 100 municipal baseball grounds and soccer fields, 26 public playgrounds for children, 2 public golf links, 2 outdoor swimming pools (one being the largest of its kind in the world), a municipal open-air theater seating 9,300, summer free band concerts attended by an average of 460,000 each summer, and an annual playground festival.

Notable Buildings.—The principal public buildings are the massive post-office and custom-house costing more than $6,500,000; the city hall, built at a cost of $2,000,000; the court house; the union railroad station; Railway Exchange; Boatmen's Bank; Central National Bank; Century; Chemical; Federal Reserve; International Life; Merchants' National Bank; Merchants' Exchange; Syndicate Trust; Title Guaranty.

The Eads bridge, a massive structure, was completed in 1874, at a cost of over $10,000,000. It consists of three spans, the center one being 520 feet long, and the other two 502 feet each. The piers upon which these spans rest are built of limestone carried down to bed rock. The main passage, for the accommodation of pedestrians, is 54 feet wide, and below this are two lines of rail. The merchant's bridge, 3 miles N., was completed in 1890, at a cost of $3,000,000. The latter is used exclusively for railroad traffic. A municipal free bridge, costing $6,250,000, spans the river.

Trade and Manufactures.—The favorable location of St. Louis in the heart of

the vast and fertile Mississippi valley makes it one of the greatest commercial cities in the United States. There is an immense trade in breadstuffs, grain, provisions, lumber, hides, agricultural products, hardware, boots and shoes, tobacco and cigars, quarries, steel castings, drugs and chemicals, dry goods, electrical products, soap and candles, wooden-ware, etc. The automobile industry is of great importance.

Commerce.—The city has direct communication with more than 6,000 miles of rivers. In the fiscal year ending June 30, 1920, the imports of merchandise aggregated in value $18,638,711.

Banks.—On Sept. 1, 1919, there were 6 National banks in operation, besides many private banks and trust companies. The total resources of the banks in 1920 were $659,220,721, with $463,944,744 in deposits. The exchanges at the United States clearing-house in the year ending Sept. 30, 1920, aggregated $8,065,368.

Education.—The St. Louis public school system is recognized by educators as one of the most complete in the United States. It has 124 public grade and high schools for white and negro pupils. The grade schools include one school for the deaf, one for dependent and delinquent children, 13 for backward pupils and two open-air schools for children tubercularly inclined. A system of parochial grade and high schools is maintained by Catholic institutions for Catholic children. St. Louis has St. Louis University, and Washington University, with its celebrated school for girls—Mary Institute. St. Louis University is the oldest Catholic university in the West. The Medical Department of Washington University, which is operated in connection with Barnes Hospital, constitutes the most extensive medical institution in America. Many other hospitals with most modern equipment give St. Louis one of the best hospital systems in the country. The City Hospital is recognized as among the most complete municipal institutions in the West. The Ranken School of Mechanical Trades is one of the most completely equipped mechanical trade schools for boys and men in the United States. Hosmer Hall, Lenox Hall, Forest Park College, Mary Institute are among the other educational institutions.

Churches.—One of the finest groups of representative architecture in the city is at Kings Highway and Washington avenue, where the four corners are occupied by magnificent churches—Temple Israel (Jewish synagogue); First Church of Christ, Scientist; St. John's Methodist Episcopal, South; and Second Baptist. The new cathedral is the seat of the Catholic Church in St. Louis. The structure cost $3,250,000, the main altars $100,000, and the organ $50,000. The old cathedral occupies the site of the first church built in St. Louis, shortly after the landing of Laclede in 1764. Pope Gregory conferred favors on this old cathedral which no other church in the world has except the Basilicas in Rome. Christ Church Cathedral, the mother church of the Episcopal Diocese of Missouri, is the first Protestant church founded west of the Mississippi river. The Young Men's Christian Association and Young Women's Christian Association maintain commodious central buildings and branches in various sections of the city.

Finances.—In 1919 the total bonded debt of the city was $13,999,706. The assessed property valuation in 1919 was $765,722,620; tax rate $23.50 per $1,000.

History.—On Feb. 14, 1764, while what is now Missouri was a part of Upper Louisiana, Auguste Chouteau, a young trader, with about 30 men, arrived at the site of the city to establish a permanent post. The spot had been selected the previous year by Laclede. France had ceded the whole of Louisiana Territory to Spain in 1762. Spain ceded it back in 1800, and in 1803 France sold it to the United States. In 1896 the city was swept by a destructive tornado that overthrew many buildings, destroyed shipping, and tore out a shore span of the great bridge. Several hundred lives were lost and many rendered homeless. Tower Grove Park and Shaw's Gardens were greatly injured. In 1904, the Louisiana Purchase Exposition was held at St. Louis. The attendance was 19, as compared with Chicago 28 (1893), and Paris 50 millions (1900).

ST. LOUIS, the capital of the French colony of Senegal in West Africa, on a small low island near the mouth of the Senegal river. Bridges connect it with N'dar Toute, a summer watering-place, on the right bank, and with the suburb of Bouetville, the terminus of the railway, on the left bank. The mouth of the river is rendered dangerous by a shifting bar of sand. The great ocean steamers land goods and passengers at Dakar, on Cape Verde, 163 miles to the S. W., and thence they are conveyed by rail. The climate is not healthy; water is supplied by an aqueduct 7½ miles long. There are a cathedral, governor's palace, etc., and a public garden. Pop. about 25,000.

ST. LOUIS, a river in Minnesota which rises in St. Louis co. in the N. W. part of the State. Its course is S. and S. E.; it flows into the W. extremity of Lake Superior, 9 miles from Duluth, and is about 200 miles long.

SAINT LOUIS UNIVERSITY, a Roman Catholic institution for higher education, founded at St. Louis, Mo., in 1832. It includes professional schools and a college of liberal arts. In 1919 there were 1,945 students and 245 instructors. President, Rev. B. J. Otting.

ST. LUCIA, the largest of the Windward Islands, in the West Indies, 42 miles long and 15 to 20 wide; area, 233 square miles; pop. (1918) 53,788. The exports (sugar, cocoa, logwood, etc.) in 1918 were valued at £362,785; imports at £368,123. Much of the island is high and rocky land, covered with well-nigh impenetrable forests, and it contains extensive deposits of sulphur. The climate is in the main healthy, a fresh trade wind blowing almost continually. The island, discovered in 1502, was colonized by the French in 1563; but between that date and 1803, when it definitively became an English possession, it five or six times changed hands between France and England, by capture or treaty. The capital is Castries. Caribbee bark is sometimes called St. Lucia bark.

ST. LUCIA BAY, a bay in South Africa, an indenture of the Indian Ocean at the mouth of the Umbolozi river in Zululand. The bay is S. of St. Lucia Lake. The Germans claimed it in 1884, but the British gained final possession in 1885.

ST. LUCIA LAKE, a lake which is really a lagoon in Zululand, South Africa, on the E. coast. It is united with the Indian Ocean by St. Lucia Bay; is 60 miles long, and varies in breadth from 10 to 25 miles.

ST. LUKE. See LUKE.

ST. MALO, a seaport in France, department of Ille-et-Vilaine, on an island at the mouth of the Rance river. It is a watering-place and has important commercial interests; is strongly fortified; has extensive docks and quays, notable ramparts, a castle, and parish church (formerly a cathedral); and is noted for the height of the tides (40 to 50 feet). It was the birthplace of Cartier, Mahé de la Bourdonnais, Lamettrie, Maupertuis, Lamennais, and Châteaubriand. The destruction of the town was attempted by the English in 1693, 1695, and 1758. Pop. about 12,000.

ST. MARK. See MARK.

ST. MARTIN, one of the Lesser Antilles, W. I. Since 1648 it has been divided between France and the Netherlands. It exports sugar, cotton, tobacco, maize, etc., and large quantities of salt. The French portion, a dependency of Guadeloupe, has an area of 20 square miles and a population of 4,500. The Dutch portion, a dependency of Curaçao, has an area of 17 square miles and a pop. (1919) 2,552.

ST. MARY BAY, an indenture of the Atlantic Ocean, on the S. coast of the peninsula of Avalon, Newfoundland. Also an inlet of the Atlantic Ocean on the W. coast of Nova Scotia.

ST. MARY ISLAND, an island of western Africa, belonging to the British colony of Gambia, at the N. of the Gambia river. Also the largest of the Scilly Islands, S. W. of Cornwall, England.

SAINT MARYS, a city of Ohio, in Auglaize co. It is on the Miami and Erie Canal, St. Marys river, and on the Lake Erie and Western and the Toledo and Ohio Central railroads. It is an important industrial community, having manufactories of machinery, wool, lumber products, strawboard, paper, flour, cigars, etc. Pop. (1910) 5,732; (1920) 5,679.

SAINT MARYS, a borough of Pennsylvania, in Elk co. It is on the Pennsylvania and the Pittsburg, Shawmut, and Northern railroads. It is in an important soft coal mining region and has deposits of natural gas and fire clay. Its chief industries are the manufacture of sewer pipes, lumber, chemicals, and electrical supplies. Large railroad shops are located here, and it is the seat of the academy of the St. Benedict Sisterhood. Pop. (1910) 6,346; (1920) 6,967.

ST. MARY'S CANAL, an improved river channel connecting Lake Superior with Lake Huron. It flows N. E. for 40 miles on the frontier between the upper peninsula of Michigan and the Canadian Province of Ontario. There are two main channels divided by large islands and both expand into small lakes at some points 10 miles wide. There is a fall of 20 feet, the steepest descent being at St. Mary's Rapids, about a mile long, near the upper end. The improvement began in 1855 with locks built at a cost of $1,000,000, and was continued in 1870-81 and 1889-96 by the United States Government. The traffic through the canal has attained great proportions in recent years, and improvements have been made on the Canadian side by the Canadian Government.

ST. MARY'S RIVER, the channel connecting Lake Superior with Lake Huron, having more the character of a lake than a river. At Sault Ste. Marie, or St. Mary's Falls, there is a fall of 16 feet, and to enable vessels to avoid this a ship canal was built in 1855, and

since greatly enlarged and improved. See SAULT STE. MARIE.

ST. MATTHEW. See MATTHEW.

ST. MAURICE, a river of Canada, Province of Quebec, which enters the St. Lawrence at Three Rivers after a course of about 300 miles through fine scenery and extensive forests. About 22 miles above its mouth are fine falls 160 feet high.

ST. MICHAEL. See ARCHANGEL.

ST. MICHAEL'S MOUNT, a conical and isolated granite rock in Mount's Bay, Cornwall, England, 3 miles E. of Penzance. It communicates with the shore by a causeway 560 yards long, which, however, is covered with water 8 hours out of 12, and sometimes is impassable for two or three days together. The Mount is 230 feet high, is 5 furlongs in circumference, and is crowned by an old and picturesque castle—now used as a manorial residence—surmounted by a tower, on one angle of which there is a projecting stone lantern, popularly called "St. Michael's Chair." At the base of the N. or landward side of the Mount is a fishing village. The "guarded mount" is said to have received its name from an apparition of St. Michael to some hermits; and Edward the Confessor founded on it a Benedictine priory, which in 1088 was annexed to the Abbey of Mont Saint-Michel in Normandy. After the Dissolution it became the residence of five families in turn, till it was sold in 1660 to its present proprietors.

SAINT-MICHEL, MONT, a fortified rocky height in the department of La Manche, France, in Cancale Bay, 7 miles S. W. of Avranches. On its summit are a castle, and an interesting church of the 10th century. There is a straggling village on the hill, with a population of about 300. It forms altogether an extremely picturesque mass, and can be approached across the sands at low water.

ST. MIHIEL, a town of France, which was the scene of several battles during the World War. It is situated on the Meuse, 11 miles N. N. W. of Commercy, and before the World War had several interesting churches, one of them the church of the former Abbey of Saint Mihiel, some quaint dwellings, and a fine stone bridge. There were two forts on the river near the town. There was also considerable commerce and industry, centering largely round the manufacture of lace and embroidery. The population before the war was about 9,000. The region round St. Mihiel and Verdun became hotly contested following the repulse of the Germans from the Marne. In the middle of September, 1914, the armies in the center had reached a deadlock, and on the E. the German Crown Prince sent large forces S. of Verdun. The Germans speedily reduced the fort of Troyon, just S. of Verdun, and had reached St. Mihiel, a little farther S. on the Meuse, thus threatening to surround Verdun, when the French re-enforced their line at this point. Thus St. Mihiel continued to be an outer defense for Metz and a possible starting-point for a strong German offensive. From that time forward, St. Mihiel continued the scene of determined attacks and counter-attacks. The Germans captured St. Mihiel on Sept. 23, 1914, and continued to hold it. Early in 1915 attempts were made by the French to carry the opposing German lines in the eastern sector, swinging round the great fortifications of Verdun, bending sharply to the Meuse at St. Mihiel and turning E. again from St. Mihiel to strike the Moselle river at a point near the Lorraine frontier. In the center of this sector the French made a desperate effort to wipe out the St. Mihiel salient; small gains were secured on the northern and southern sides of the wedge, but the main objective was not achieved. The net result was a success for the Germans, culminating on July 6, 1915. Matters stood in this condition till the arrival of American forces in 1918, and the beginning of the battle of St. Mihiel in September of that year. On September 12, the American forces attacked both flanks of the St. Mihiel salient, and captured Thiaucourt and other important positions with 8,000 prisoners. The chief resistence was in the W., where the German positions were defended by the heights on the edge of the Woëvre. So impetuous was the attack, which followed four hours' bombardment, that on the following day the forces advancing from the S. and W. met at Vigneulles and the St. Mihiel salient was no more. At the end of the American attack, seventy villages had been taken and nearly 175 square miles of territory; 16,000 prisoners were taken and 450 guns; the great French railway system, running through Verdun, Toul, and Nancy, was freed and a strategically important position was obtained from which subsequently an offensive might be launched against Metz and the iron fields of Briey. It was the beginning of the end, which came a few weeks later. See WORLD WAR.

ST. NAZAIRE, a seaport of France, department of Loire-Inférieure, on the N. side of the estuary of the Loire, 40 miles W. by N. of Nantes. Between 1831 and 1887 $7,250,000 was spent on harbor improvements, extensive docks (82 acres) having been built in 1845-1857 and 1864-

1881 to accommodate the larger vessels that were unable to get up the Loire to Nantes. Since these began to be used the shipping of the place has increased at a very rapid rate. The most important of the imports are wine, coal, tar, iron and lead, wheat and flour, timber, and manure; the exports embrace chiefly brandy, wine, coal, wheat and flour—these four in transit—eggs and poultry, sardines, butter, bonedust, vegetables, dyes, glass, and toys. The city was one of the most important naval depots of France during the World War. Pop. about 38,000.

ST. NICHOLAS, an early bishop of Myra in Lycia, Asia Minor. He is a popular saint in the Roman and the Greek Churches, being considered the patron of sailors, travelers, merchants, parish clerks, virgins and children. His feast day, falling on Dec. 6, was once elaborately celebrated in English public schools, the solemnities continuing to Dec. 29. These curious practices died out after the Protestant Reformation, vestiges of it lingering longest at Eton. The best-known legend connected with St. Nicholas' name represents him as visiting, on three successive nights, the home of a poor nobleman distressed about the future of his three daughters, and throwing a purse of gold through the window each night. It has long been a custom in certain European countries to keep St. Nicholas' Eve by placing gifts in the shoes or stockings of children. This custom has been transferred to Christmas Eve and the transformed saint is known as Santa Claus (from the Dutch Sant Nicolaus).

ST. NICOLAS, a town of Belgium, in East Flanders, 12 miles W. by S. of Antwerp, in the district of Waes, a densely-peopled and productive agricultural region. It has a large flax market, and manufactures cotton and woolen stuffs, lace, needles, bricks, and pottery. A flourishing trade is carried on in linens, flax, corn, etc. Pop. about 32,000.

ST. OLAF COLLEGE, a coeducational institution in Northfield, Minn.; founded in 1874 under the auspices of the Lutheran Church; reported at the close of 1920: Professors and instructors 48; students, 794; president, Julius Boraas, Ph.D.

ST. OMER, a town of France, and second-class fortress, department of Pas-de-Calais, in a marshy site, on the Aa, 26 miles S. E. of Calais. The chief objects of interest are the Gothic cathedral (13th-15th century), with remarkable sculptures, the ruined tower and arches of the Benedictine Abbey Church of St. Bertin, an arsenal, a museum, and a library. A college for the education of English and Irish Catholics was opened at St. Omer in 1592. It was closed, however, during the Revolution, but still exists as a seminary. Alban Butler was a president, and O'Connell a student. The people carry on active manufactures of tobacco-pipes, tulle, cambric, cloth, and muslin, and a brisk trade in provisions, sugar, and spirits. Pop. about 21,000.

SAINTONGE, a former French maritime province, now forming mainly the department of Charente-Inférieure. The capital was Saintes.

ST. PATRICK. See PATRICK, ST.

SAINT PAUL, the capital of Minnesota. It is on the Mississippi river, and on the Great Northern, the Northern Pacific, the Chicago, St. Paul, the Minneapolis and Omaha, the Rock Island, Burlington, Great Western, the Chicago, Milwaukee and St. Paul, the Minneapolis and St. Louis, and other railroads. The city is most attractively situated on the banks of the Mississippi. The business portion is built on a foundation of solid rock. Trolley lines radiate in all directions, leading to the suburbs, and scores of lakes lie within a short drive from the heart of the city. The city is provided with good arterial highways running into the country, as well as paved streets within the city itself. There are nearly 100 miles of paved streets and over 45 miles of macadamized streets. Travel and trade from without the city are facilitated by 12 important national highways which pass through it.

There are within the city limits 52 improved parkways with an area of over 1,600 acres, 21 unimproved parks, 12 boulevards, and 10 public playgrounds. The largest of the parks is Phalen Park; with an area of 487 acres, 247 of which are taken up by a lake which has a bathing beach. Como Park is 427 acres in extent. In it are located the botanical gardens of the city, as well as game preserves of elk, buffalo, and deer. The most notable public buildings of the city are the State Capitol, which is conceded to be one of the finest and most artistic administration buildings in the world, the city hall, Federal buildings, post office, public library, the James J. Hill Reference Library, and the Municipal Auditorium. The latter building was built by popular subscription of the citizens. In its upper floors is housed the St. Paul Institute, which maintains a free art gallery and a museum, and is the center of the educational and intellectual activities of the city. The Minnesota State Art Society has its headquarters in the Old Capitol Building, and there it has an unusually

large collection of pictures, sculpture, and craft work.

St. Paul is notable for its beautiful private residences. The principal residential street is Summit Avenue, but there are others scarcely less notable. The hills on which the city is built make the residential portions particularly attractive, and in every direction from its center lie attractive suburbs. Among the suburbs lying S. along the river is South Saint Paul, where are located the great stock yards.

The city has an excellent school system comprising public and high schools. There were in 1920, 62 public grade and high schools, with a teaching and supervising staff of 750, and an enrollment of over 35,000 pupils. In addition there are 46 private and parochial schools with an attendance of about 13,000. There are six colleges and universities, including the State College of Agriculture. The State University is within ten minutes ride from the city limits. There are 11 business and trade schools, 8 schools of music, and 3 art schools.

St. Paul has facilities for large river traffic. The municipal dock is equipped with the most modern facilities. Four railroads have direct access to the river front on different portions of the harbor. There is an adequate supply of power derived from water power developments in the neighborhood of the city. There is also available a supply of gas for those industries which require this commodity for a source of energy.

There were in 1919 849 manufacturing establishments, with 41,248 wage-earners, a capital investment of $155,685,000, and a product valued at $215,000,000. The most important industries are boots and shoes, the manufacture of butter, cheese and condensed milk, railroad repair shops, foundry and machine shop products, fur goods, and meat packing. It is also one of the most important milling centers of the United States. St. Paul is a wholesale jobbing center for the surrounding country.

There were in 1920, 32 banks with an aggregate capital of $10,040,373, and surplus and undivided profits of $5,776,480. The bank clearings at the close of 1919 amounted to $961,376,325. The assessed value of property on December 31, 1919, was $135,804,277, of which $99,300,903 was in real estate. The net bonded debt was $8,300,941. Pop. (1900) 163,065; (1910) 214,744; (1920) 234,698.

History.—A French Canadian settled on the site of the city in 1838. Three years later Father Gaultier, a French Catholic priest, founded the first church here, and named it St. Paul, from which the city derived its name. It received its city charter in 1854, and united the suburb of West St. Paul in 1874. Since the latter year there has been such a rapid growth that the outskirts of the city reach those of Minneapolis. These two cities are known as "The Twin Cities of the West."

ST. PAUL, a volcanic islet 2 miles long, and 860 feet high, in the Indian Ocean, midway between Africa and Australia. It is comparatively bare, in contrast to the smaller but densely vegetated island of New Amsterdam, 50 miles to the N. St. Paul's Rocks is a group of small islets 1° N. of the equator and 540 miles from the South American coast.

ST. PAUL, an island near the entrance of the Gulf of St. Lawrence, N. E. of Cape Breton. It is small; its surface is undulating and hilly; and it is traversed by strips of forest.

ST. PAUL'S, a cathedral in London, England, situated on Ludgate Hill, an elevation on the N. bank of the Thames. The site of the present building was originally occupied by a church erected by Ethelbert, King of Kent, in 610. This was destroyed by fire in 1087, and another edifice, Old St. Paul's, was shortly afterward commenced. The structure was in the Gothic style, in the form of a Latin cross, 690 feet long, 130 feet broad, with a lead-covered wooden spire rising to the height of 520 feet. The middle aisle was termed Paul's walk, from its being frequented by idlers as well as money lenders and general dealers. Old St. Paul's was much damaged by a fire in 1139, by lightning in 1444, again by fire in 1561, and was utterly destroyed by the great fire in 1666. The ruins remained for about eight years, when the rebuilding was taken in hand by the government of Charles II. (1675-1710). The whole building was completed at a total cost of $7,556,010 by Sir Christopher Wren. It is of Portland stone, in the form of a cross. Its length is 510 feet; the width from N. to S. portion 282 feet; the general height is 100 feet. The whole is surmounted by a great dome raised on eight arches. Above the dome is a lantern or gallery terminated above by a ball and gilded cross, 363 feet from the pavement beneath. The elevated portico forming the grand entrance consists of 12 Corinthian columns, with an upper series of eight pillars of the Composite order, supporting a pediment; the front being flanked by two bell-towers 120 feet in height. The entablature represents in relief the conversion of St. Paul, a work of Francis Bird. On the S. front, which corresponds with the N., is a phœnix rising from the flames, with the motto, "Resurgam" (I

shall rise again). The pavement of the interior is composed of slabs of black and white marble. The crypt under the nave contains the burying-places of many illustrious personages, and some interesting relics of old St. Paul's. Among the numerous monuments and statues to the illustrious dead may be noted those of John Howard and Dr. Johnson, by Bacon; statues of Nelson, Earl Howe, and Sir Joshua Reynolds, by Flaxman; Bishop Heber, by Chantrey; and monuments to Lord Rodney, Lord Heathfield, Admiral Collingwood, General Abercrombie, etc., by Rossi, Westmacott, and others. The monument to the Duke of Wellington, by Alfred Stevens, is accounted the finest work of its kind in England. It consists of a rich marble sarcophagus and canopy elaborately ornamented with bronze sculptures. It is 30 feet in height and cost upward of $150,000.

ST. PAUL'S BAY, a bay on the N. coast of Malta, notable as being the traditional scene of St. Paul's shipwreck. It is 6½ miles from Valetta and its environments are prominent in Biblical literature.

ST. PAUL'S ROCKS, a group of small islands in the Atlantic Ocean, E. of South America. They are characterized by great bowlders scattered over their surface, and by the rocks at their bases in the sea, making an approach to them dangerous.

ST. PAUL'S SCHOOL, an English school, in West Kensington, London; originally founded in 1509. Among its pupils have been Major André, Camden, Roger Cotes, Sir P. Francis, Halley, Leland, the Duke of Marlborough, Milton, Robert Nelson, Pepys, Strype, and Judge Jeffreys.

ST. PETER, LAKE, a sheet of water which is really an expansion of the St. Lawrence river, near Three Rivers. Many rivers flow into it, the largest being the St. Francis. There are many islands in its S. half, several of which are notable for beautiful scenery. The lake is 35 miles long and its greatest breadth is 10 miles.

ST. PETER PORT, the capital of the island of Guernsey, one of the Channel Islands; about 25 miles from St. Helier. It is a watering-place and has a beautiful Gothic church. Pop. about 20,000.

ST. PETER'S, the Cathedral of Rome, the largest and one of the most magnificent churches in Christendom. It is a cruciform building in the Italian style, surmounted by a lofty dome, built on the legendary site of St. Peter's martyrdom. In 306 Constantine the Great erected on this spot a basilica of great magnificence. In the time of Nicholas V. it threatened to fall into ruins, and he determined on its reconstruction, but the work of restoration proceeded slowly, and Julius II. (1503–1513) decided on the erection of an entirely new building. He laid the foundation stone of the new cathedral on the 18th of April, 1506, and selected the famous Bramante as his architect. After the latter's death various architects had charge of the work till Michelangelo was appointed in 1546. He nearly completed the dome and a large portion of the building before his decease (1564). The nave was finished in 1612, the façade and portico in 1616, and the church was dedicated by Urban VIII. Nov. 18, 1626. The extensive colonnade which surrounds the piazza and forms a magnificent approach to the church was begun by Bernini in 1667, and the sacristy erected by Carlo Marchionni in 1776. The interior diameter of the dome is 139 feet, the exterior diameter 195½ feet; its height from the pavement to the base of the lantern 405 feet, to the top of the cross outside 435 feet. The length of the cathedral within the walls is 613½ feet; the height of the nave near the door 152½ feet; the width 87½ feet. The width of the side aisles is 33¾ feet; the entire width of the nave and side aisles, including the piers that separate them, 197¾ feet. The circumference of the piers which support the dome is 253 feet. The floor of the cathedral covers nearly 5 acres, and its cost is estimated to have exceeded $50,000,000.

SAINT PETERSBURG, a city of Florida in Pinellas co. It is on the peninsula separating Tampa Bay from the Gulf of Mexico, and is on the Atlantic Coast and the Tampa and Gulf Coast lines. It has an excellent harbor and in recent years has developed an important commerce. It is also a favorite winter resort. The population since 1910 has rapidly increased. Pop. (1910) 4,127; (1920) 14,237.

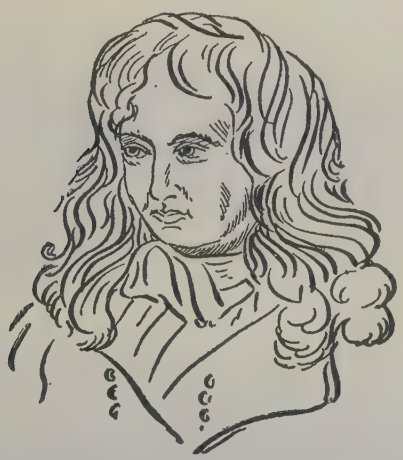
ST. PETERSBURG. See PETROGRAD.

ST. PIERRE, the largest town, though not the capital, of the island of MARTINIQUE (*q. v.*), W. I. It was founded in 1665, and at the time of its destruction by an eruption of Mont Pelée in 1902 it had a population of from 26,000 to 30,000, and was of considerable commercial importance. It was the birthplace of Josephine, consort of Napoleon I.

SAINT PIERRE AND MIQUELON, a French colony, 10 miles S. of Newfoundland, consisting of the three islands of Saint Pierre, Ile-aux-Chiens, and Miquelon, having in all an area of 93 square miles. They are only moderately fertile, but are of importance as the center of the

French cod fisheries, which employ many thousand persons, with exports amounting to nearly $3,000,000 per annum. The capital of the colony is Saint Pierre, where the headquarters of the governor are situated, and a representative of the colony sits in the French Chamber of Deputies. The capital has cable communication with Europe and lines of steamers run between it and Boston and Halifax. Pop. about 6,000. The islands were the subject of controversies and wrangling between French and English from 1713 to 1816, but in the latter year France was confirmed in their possession.

SAINT-PIERRE, JACQUES HENRI BERNARDIN DE, a French author born in 1737. He learned engineering, and in the capacity of engineer worked in Malta, Russia, and Germany, and for about three years for the French Govern-



JACQUES H. B. DE SAINT-PIERRE

ment in Mauritius. Having returned to France he betook himself to literature. His "Studies of Nature," published in 1783, first secured him a literary position. Then followed his chief works: "Paul and Virginia" (1787) and "Indian Cottage" (1790), both of them (especially the former) very popular. In 1795 he was admitted to the Institute. He died in 1814.

ST. POL DE LÉON, a town in the Breton department of Finistère, France, near the English Channel, 13 miles N. N. W. of Morlaix. It has a 13th-century cathedral, dedicated to St. Pol, who came hither from Cornwall in the 6th century, and also the Kreizker church, with a beautiful spire 252 feet high.

ST. QUENTIN, a town in the French department of Aisne, on the Somme, 95 miles N. E. of Paris and 33 S. of Cambrai. The church of St. Quentin is a remarkably fine Gothic structure, dating from the 12th to the 15th century, and containing a much more ancient crypt. The town hall (15th and 16th centuries) is also a fine specimen of Gothic. The town is a center of the cotton industries, including the making of calicoes, tulle, cretonnes, jaconets, muslin, merino, cambric, gauze, and so forth. Further, vast quantities of embroidery are prepared, and machinery, hats, paper, sugar, soap, and beer are manufactured. St. Quentin and its vicinity has been the scene of memorable battles. The Spaniards under the Duke of Savoy and Ferdinand Gonzaga, assisted by an English contingent under the Earl of Pembroke and Egmont in command of the Flemings, inflicted a crushing defeat on the French under Constable Montmorency, Aug. 10, 1557 (St. Lawrence's Day), a victory which Philip II. commemorated in the Escorial. Shortly afterward the town, after a brilliant defense by Coligny, capitulated to the Spanish army. On Jan. 19, 1871, the Germans under Von Goeben put to rout the army of Faidherbe, capturing nearly 10,000 prisoners. During the World War St. Quentin was reduced to ruins by the German guns. By the terms of the Treaty of Peace (1919) the city is to be rebuilt by German labor. Pop. before the war about 55,500.

ST. REMY, a town in the department of Bouches-du-Rhône, France; 15 miles N. E. of Arles. Near it are antiquities from the Roman town of Glanum Livii. The most noteworthy are the triumphal arch, A. D. 100, and the tomb, or monument, of the Julii. The latter is about 60 feet high, rising two stories above the square base. Around the base is a series of military scenes in relief; the first story is pierced by archways, and decorated with Corinthian semi-columns; and the second story is a circular edicule with 10 Corinthian columns and a domical roof sheltering two statues. This monument is assigned to the time of the early empire.

SAINT-SAËNS, CHARLES CAMILLE, a French musician; born in Paris, France, Oct. 3, 1835. At the age, it is said, of two and a half years he was taught the pianoforte by his great-aunt, and at seven he had further instruction from Stamaty, and subsequently learned harmony under Maleden. In 1847 he studied the organ under Benoist. At the age of 16 he wrote his first symphony, which was performed with success, and was followed by numerous other instrumental works. He became organist, first of the church of St. Méry, and in 1858 of the Madeleine, where he continued till 1877. His first opera, "The

Yellow Princess," was given in 1872, and "The Silver Bell" in 1877; but neither was successful. "Samson and Dalila," a sacred drama, was produced at Weimar also in 1877, and was subsequently successfully revived at Rouen. More important operas are: "Henry VIII.," brought out in 1883 at the Grand Opéra with success, not however extending to its subsequent revivals; "Proserpina," given in 1887, but received with disapprobation; and "Ascanius," produced at the Grand Opéra, March 21, 1890, and well received, though not with unmixed praise; "The Barbarians" (1901); "Andromaque" (1903); "L'Ancêtre" (1906). He was one of the greatest performers on the piano and organ, and had remarkable powers of improvisation. He appeared as a performer in various countries. His reputation as a composer is high, though he has not attained the highest rank in opera. He wrote several works on music.

SAINTSBURY, GEORGE EDWARD BATEMAN, an English littérateur; born in Southampton, England, Oct. 23, 1845; was educated at King's College School, and Oxford. From 1868 till 1876 he filled scholastic appointments at Manchester, Guernsey, and Elgin, but soon after established himself in the literary world of London as one of the most active and influential critics of his day. He was an active contributor to the greater magazines (of "Macmillan's" he was for some time editor) and to encyclopædias. Among his books are a "Primer" (1880) and a "Short History" (1882) of French literature; "Dryden" in "English Men of Letters" (1881), and "Marlborough" in "English Worthies" (1885); a "History of Elizabethan Literature" (1887); a short history of "Manchester" (1887); "Essays in English Literature, 1780–1860" (1890); "Essays on French Novelists" (1891); "Short History of English Literature" (1898); "Matthew Arnold" (1899), etc. Besides these he edited Scott's "Dryden," "Specimens of French Literature, from Villon to Hugo" (1883); "Specimens of English Prose Style, from Malory to Macaulay" (1885); Corneille's "Horace," and other French classics for schools; and a translation of Scherer's "Critical Essays on English Subjects" (1891). In 1895 he became Professor of Rhetoric and English Literature at Edinburgh University. Among his later works were "History of Criticism" (1900); "History of English Prosody" (1906–1908); "History of English Prose Rhythm" (1912); "The English Novel" (1913), etc.

SAINTS' DAYS, days set apart by traditional usage or authority of the Church for anniversary celebrations in honor of particular saints. They were first instituted in honor of martyrs.

ST. SEBASTIAN, a celebrated Roman martyr; born in Narbonne about 255. According to the anonymous "Acts" by which his history is preserved (supposed to have been written in the 4th century, and by some attributed to St. Ambrose), he was a captain in the prætorian guard under Diocletian, and used the facilities afforded by his station to propagate the Christian faith. Having refused to abjure his religion, he was tied to a tree, shot with arrows, and left for dead. A Christian woman found him still alive, and cared for him till he was restored; but, having ventured to appear before Diocletian to remonstrate against his cruelty, he was beaten to death with clubs. In the 9th century his relics were distributed throughout Christendom as a remedy against the plague. He died in Rome, Jan. 20, 288.

ST. SERVAN, a seaport of France, department Ille-et-Vilaine, on the E. side of the estuary of the Rance, just above St. Malo (*q. v.*), from which it is separated by a creek a mile wide. It has a floating dock, is much frequented as a watering-place, and carries on shipbuilding and its cognate branches, and has a little commerce in fruit, potatoes, barley (exports), coal, and timber (imports). Close by are the ruins of the cathedral of Aleth (6th to 12th century). Pop. about 12,000.

SAINT SIMON, CLAUDE HENRI, COUNT DE, a French social philosopher, the founder of French socialism; born in Paris, France, in 1760. After completing his education he entered the army, and in 1777 was included in an expedition sent by Louis XVI. to assist the United States in her war with England. After seeing some service under Washington, and traveling through Mexico, he returned to France and was appointed colonel in the French army. He, however, took no interest in his military duties, as he intended to devote his life to the advancement of human civilization. On the breaking out of the Revolution, though he warmly sympathized with the movement, he took no part in the subsequent events, but retired entirely from the army, and bought a considerable quantity of confiscated land, with the view of establishing a large scientific and industrial school; but the scheme was a failure, and St. Simon retired from it after losing a vast sum of money. From this time he devoted himself to what he termed a "physico-political" reformation, for which purpose he entered into the study of all the physical sciences—mathematics, as-

tronomy, general physics, and chemistry —and all the general science attainable with respect to organized beings. He next proceeded to make his "experimental education"; he married and continued to pursue his prescribed career, in which good and evil were confounded. This, however, in 1807, came to an end; his fortune was gone, and he was compelled to become a clerk in a government office at a small yearly salary. In 1812, he being then in his 52d year, he considered it time to "establish his theory," and published a number of remarkable works which attracted round him a large number of disciples. His last efforts were directed toward the foundation of a new religion, which he called the New Christianity, in which society was to be reorganized on this formula: "To each man a vocation according to his capacity, and to each capacity a recompense according to its worth." Before breathing his last he gave final instructions to his chief disciples, among whom were Augustin Thierry and Comte, the future author of the "Positive Philosophy." His most important works were, "Introduction to the Scientific Labors of the Nineteenth Century," "The Reorganization of European Society," and "New Christianity." He died in 1825.

ST. STEPHEN, THE DEACON, called also the "protomartyr," or earliest of the Christian martyrs; one of the seven deacons whose appointment is related in the 6th chapter of the Acts of the Apostles. The circumstances of his martyrdom are related in the same chapter.

ST. SULPICE, a famous diocesan seminary for priests in Paris, close by the large and wealthy church of St. Sulpice, on the S. side of the Seine, near the Luxembourg.

ST. THOMAS, a volcanic island of Africa belonging to Portugal; in the Gulf of Guinea; 166 miles W. of the mouth of the Gabun river. Its S. extremity almost touches the equator. Measuring 32 miles by 21, it has an area of 360 square miles; pop. about 59,000. Though it rises to the altitude of 7,000 feet, it has the reputation of being very unhealthy. Coffee and cocoa, with some pepper, cinnamon, maize, indigo, etc., are the principal products. Chief town, St. Thomas, on the N. E. coast, the seat of a bishop. The island was discovered in 1470, and colonized in 1493 by the Portuguese, to whom it reverted after a Dutch occupation from 1641 to 1844.

ST. THOMAS, one of the Virgin Islands, W. I., formerly belonging to Denmark, but now territory of the United States; 36 miles E. of Porto Rico; area, 33 square miles. English is the language of the educated classes. The surface is hilly and the soil poor. The cultivation of vegetables, guinea grass, and a small quantity of cotton employs the scanty rural population. The port, St. Thomas, was formerly a busy emporium for the European trade of the West Indies, the harbor in which the merchant fleets assembled to wait for their convoys, and later the principal port of call in the West Indies. All these advantages have now passed from it. Before the abolition of slavery it was covered with prosperous sugar plantations. The island is often visited by earthquakes, but they are not, as a rule, so destructive as the cyclones. It was first colonized by the Dutch in 1657. The British held it in 1667–1671, 1801, 1807–1815; and the United States purchased it from Denmark in 1916. Pop. (1917) 10,191.

ST. THOMAS, a city and capital of Elgin co., Ontario, Canada; on Kettle creek, on the Michigan Central, the Canadian Pacific, the Wabash, the Père Marquette, and the Grand Trunk railroads; 75 miles S. W. of Hamilton. Here are numerous churches and hotels, waterworks, gas and electric lights, several branch banks, and a number of daily and weekly newspapers. The city has flax, planing, and flour mills, the Michigan Central railroad shops, and manufactories of car-wheels, carriages, mattresses, brooms, spokes, churns, etc. Pop. about 20,000.

ST. VINCENT, one of the British islands in the West Indies, Windward Group, 105 miles W. of Barbadoes; area, 140 square miles; pop. (1919) 53,210, of whom about 3,000 are whites and Hindu coolies, the rest being negroes and people of mixed blood. The island is traversed from N. to S. by a chain of volcanic mountains, which rise in the volcano called the Souffrière to 3,500 feet. This volcano erupted May 7, 1902, with great violence, causing about 1,600 deaths. The climate is healthy. Sugar, rum, cocoa, spices, and arrowroot are the principal products. The chief town is Kingstown (pop. about 5,000), at the head of a bay on the S. W. coast. The island is ruled by a governor and a nominated legislative council of seven members; previous to 1877 it had a representative government. St. Vincent was discovered by Columbus in 1498, and was then inhabited by Caribs. These people were left in possession down to 1783, although Charles I. gave the island to the Earl of Carlisle in 1627. In 1797 the Caribs, rebelling with French aid, were transferred to the island of Ruatan in the Bay of Honduras.

ST. VINCENT, CAPE, a promontory forming the S. W. corner of Portugal, off which several important naval battles have taken place. On June 16, 1693, the English Admiral Rooke was here attacked by a superior French fleet, and defeated with the loss of 12 men-of-war and 80 merchantment which were sailing under his convoy; on January 16, 1780, Admiral Rodney destroyed here several Spanish ships of Langara's fleet; on February 14, 1797, the great battle of Cape St. Vincent resulted in the total defeat of the Spaniards and capture of some of their largest ships. This victory frustrated the formidable Spanish-French scheme of invading England. The fourth naval fight off Cape St. Vincent took place between the fleet of Queen Maria of Portugal, commanded by Sir Charles Napier, and that of Dom Miguel, in which a portion of the latter was destroyed and the rest captured, July 5, 1833.

ST. VINCENT, JOHN JERVIS, EARL OF, an English naval officer; born in Meaford Hall, Staffordshire, England, Jan. 9, 1734. Running away to sea as a boy, he rose to be a naval lieutenant in 1755, and so distinguished himself in the Quebec expedition in 1759 as to receive the rank of commander. As captain of the "Foudroyant" in 1778 he fought in the action of Brest, and in 1782 captured the "Pégase," of 74 guns, whereupon he was made K. B. In 1793 he commanded the naval part of the successful expedition against the French West India Islands. In 1795, now admiral, he received the command of the Mediterranean fleet. On Feb. 14, 1797, with only 15 sail of the line and seven frigates, he fell in, off Cape St. Vincent, with the Spanish fleet of 27 sail. Jervis determined to engage the enemy, and the battle of St. Vincent was fought; but it should be remembered that the genius of Nelson contributed greatly to the success of the day. For this victory the king created Jervis Earl St. Vincent, and Parliament settled on him a pension of $15,000 a year. After having, by great firmness, repressed a mutiny off Cadiz which threatened the loss of the whole fleet, he was compelled by ill-health to return home. He subdued the spirit of sedition which had openly manifested itself in the Channel fleet; held the appointment of First Lord of the Admiralty, 1801-1804; reformed innumerable crying abuses; having for a second time commanded the Channel fleet, he retired and died March 13, 1823. He was buried at Stone, in Staffordshire.

ST. VINCENT DE PAUL. See VINCENT DE PAUL, ST.

ST. VITUS' DANCE. See CHOREA.

SAIONJI, MARQUIS KINMOCHI, a Japanese statesman and a member of the Japanese peace delegation at the Paris Peace Conference in 1919. He was born in Kyoto in 1849, and in his youth took part in the political activities following the revolution of 1868. From 1869 to 1880 he studied in Paris. On his return to Japan he joined Prince Ito and other advocates of liberal reform ideas. He was a member of the commission which studied foreign governments, in 1882. He served as Japanese Minister at Vienna and at Berlin, and held various important posts in the Japanese Government, becoming, in 1903, leader of the Constitutional Party. From 1906 to 1908 he was Prime Minister and again in 1911–12.

SAIS, an ancient Egyptian city, on the right bank of the Canopic branch of the Nile. It gave its name to two Egyptian dynasties, the 24th and 26th, founded by natives of the city. Sais was important as a religious capital, and had a famous temple of the goddess Neith and the tomb of Osiris. Toward the decline of the monarchy it rose to great splendor. The 26th dynasty transferred hither the capital of the kingdom. It was also a renowned seat of learning, and was frequently visited by the sages of Greece. The legend of the mysterious veiled statue in the temple at Sais (which formed the subject of Schiller's ballad and of Novalis' romance) is the issue of Greek invention.

SAIVAS, the name of one of the three great divisions of Hindu sects. The word designates the votaries of Siva, and comprises different special sects which varied in number at different periods of mediæval Hinduism.

SAKHALIN (Japanese **KARAFUTO**), a long island in the North Pacific, separated from Manchuria by the Gulf of Tartary, opposite the mouth of the Amoor; area, about 27,800 square miles. The center is mountainous. There are three parallel ridges running from N. to S., from 2,000 to 5,000 feet above sea-level, and densely covered with conifers. Climate, flora, and fauna are almost Siberian. The island formerly belonged to the Chinese empire, but early in the 19th century the Japanese took possession. In 1875 the Russians obtained its cession from Japan. The southern half of the island (area, 13,048 square miles; pop. about 68,000) was ceded to Japan by the treaty of Portsmouth (1905). The Russian portion has a population of about 34,000.

SAKKARA, a village of Egypt, where is the necropolis of ancient Memphis. It is remarkable for its ancient monuments, pyramids, etc.

SAKI, a monkey, called also fox-tailed monkey, belonging to the *Cebidæ*, genus *Pithecia*. These animals usually reside in the outskirts of forests, in small societies of 10 or 12 individuals. On the slightest provocation they display a morose and savage temper; and, like the howlers, they utter loud cries before sunrise and after sunset.

SAKI, or **SAKE**, the native beer and common stimulating drink of the Japanese. It is made from rice, and is drunk warm, producing a very speedy but transient intoxication.

SAKIEH, SAKIA, or **SAKEEYEH**, a machine used in Egypt for raising water from the Nile for the purpose of irrigation. It is a modification of the Persian wheel, and consists of a series of cogged wheels, turned by a buffalo or camel, each revolution of the wheel working up a series of earthen pitchers which empty themselves into a trough or pool.

SAKMARA, a river of Asiatic Russia, rising in the Ural Mountains, and after a S. course of 350 miles, joining the Ural river, 20 miles S. E. of Orenburg.

SAKYAMUNI, or the "Saint Sákya," a name of the founder of the Buddhist religion. See BUDDHISM.

SAL (sal), one of the most valuable timber trees of India, *Shorea robusta*, natural order *Dipteraceæ*, growing to the height of 100 feet. Extensive forests of it exist in northern India, where it is largely used in carpentry of all kinds, the wood being light brown in color, hard, and uniform in texture. It yields a whitish, aromatic, transparent resin (sometimes called dammar), used to caulk boats and ships, and also for incense. The sal forests are now protected by government.

SALA, GEORGE AUGUSTUS HENRY, an English journalist; born in London, England, in 1828; early became a contributor to "Household Words"; was the founder and first editor of the "Temple Bar Magazine"; visited the United States as a correspondent of the London "Daily Telegraph" in 1863; went to Algeria in the same capacity in 1864; and was a war correspondent during the Franco-Prussian War in 1870. For several years he edited "Sala's Journal." He acquired a fortune in journalism, but was extravagant and finally became bankrupt. His writings include: "Twice Round the Clock," "A Journey Due North," "My Diary in America in the Midst of War," "From Waterloo to the Peninsula," "My Life and Adventures," etc. He died in Brighton, England, Dec. 8, 1895.

SALADIN, or **SALAHEDDIN**, a celebrated Sultan of Egypt and Syria; born in 1137. In the time of the Crusades he distinguished himself by his valor. He made great conquests in Syria, Arabia, Persia, and Mesopotamia; after which he defeated the Christians with great slaughter near Tiberias and took Guy de Lusignan, King of Jerusalem, prisoner. This was followed by the surrender of Jerusalem, where he behaved with great generosity to the Christians. In 1189 Richard Cœur-de-Lion, with his ally, Philip Augustus, King of France, laid siege to Acre, which, after a two years' struggle, was taken by them. The crusaders subsequently took Cæsarea and Jaffa, and Richard Cœur-de-Lion advanced to within a short distance of Jerusalem; but a truce was afterward concluded between Saladin and the Christians; soon after which the Sultan died, broken down by his constant toil. He died in Damascus in 1193.

SALAL BERRY, the fruit of *Gaultheria shallon*, growing in the valley of the Oregon, about the size of a common grape, of a dark-purple color and of sweet, pleasant flavor.

SALAMANCA, a village of New York, in Cattaraugus co. It is on the Allegheny river and on the Pennsylvania, the Erie, the Buffalo, Rochester, and Pittsburgh, and the Western New York and Pennsylvania railroads. It is the center of an important lumber region and has railroad repair shops, manufactures of furniture, lumber, leather, etc. Pop. (1910) 5,792; (1920) 9,276.

SALAMANCA, a city of Spain; on and between three low hills beside the river Tormes, 110 miles N. W. of Madrid. From the middle of the 13th to the close of the 17th century it was the seat of one of the most celebrated universities in Europe. In Salamanca's palmy days her population reached 50,000. The library, founded in 1254, contains over 70,500 volumes and 870 MSS. The city is still surrounded with walls, pierced by 10 gates, and preserves very much of its mediæval appearance, its houses, convents, and churches, its streets and squares having altered but little since the university began to decline. The river is crossed by a bridge of 27 arches, in part of Roman construction. The great square is the largest perhaps in Spain; it is surrounded by an arcade, and has on one side the municipal buildings. It was used for bull fights, and can hold 20,000 spectators. The city possesses two cathedrals; the old

cathedral, cruciform in shape, late Romanesque in style, and dating from the 12th century, is richly decorated with paintings and monuments; the new cathedral (1513–1734) is a florid Gothic pile, also richly decorated. Among the remaining noteworthy buildings are the Jesuit College (1614), Renaissance in style; the Old College, now the governor's palace; the convents of the Dominicans and the Augustinians, the churches of which are both elaborately ornamented. In the Middle Ages Salamanca was famous for its leather work; at the present day it has not much industry save a little manufacture of cloth, linen, leather, and pottery. The town was captured by Hannibal in 222 B. C. The Moors were expelled from its walls in 1055. During the Peninsular War it was taken by the French (1812), who committed great destruction in one of its quarters, and in the vicinity Wellington defeated Marmont on July 22, 1812. Pop. about 35,000.

SALAMANCA, UNIVERSITY OF, a famous Spanish university. It was established about 1230 by Alfonso IX. of Leon and attained its greatest influence during the period from the 15th to the 17th century. While it embraced all the chief studies of the time, students particularly sought there instruction in canon and civil law. The Spanish monarchs aided it, particularly Ferdinand of Castile and Alfonso the Astronomer. Its financial condition was, however, not always flourishing and the Popes repeatedly came to its aid. In the 16th and 17th century it shared almost the supremacy in Europe enjoyed by Paris in an earlier age. It has since been reorganized and its students now number about 1,500.

SALAMANDER, a genus of reptiles, order *Batrachia*, allied to the frog, from which it differs in having an elongated body terminated by a tail, and four feet of equal length. There are no gills in the adult animal. Salamanders are endowed with an astonishing power of reproduction; and, when mutilated, their limbs, tail, and even their eyes, are restored at the end of two or three or six months.

The common salamander of Europe has been celebrated from antiquity for its supposed power of braving fire, but this is a fable.

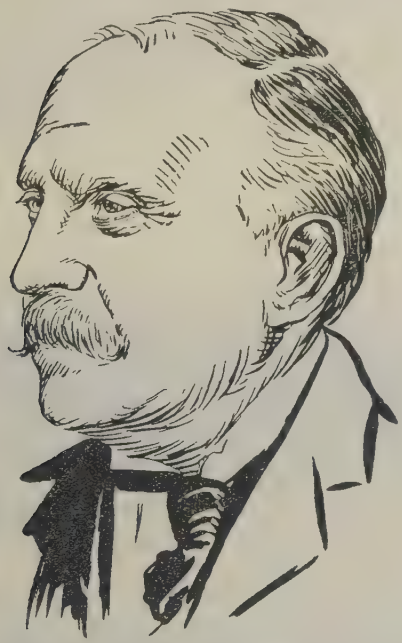
It would seem that the United States produce a greater variety of salamanders than any other part of the globe. We shall particularize the following, among the land salamanders: *S. subviolacea*, a large stout species, blackish, with two rows of large, round, whitish spots on the back. *S. fasciata;* green; less than the preceding; blackish, with transverse bluish-white bands on the back; found from New Jersey to South Carolina, but rare. *S. glutinosa;* green; a more slender species, with the tail nearly twice the length of the body; blackish, sprinkled on the upper parts of the body with white specks. It is found in most parts of the United States, and as far N. as lat. 43°. *S. longicauda;* green; whitish, with numerous black specks. It is found in the Atlantic States, but is more frequently met with in the limestone caves of the West. *S. bilineata*, green; a small slender species; above brown, beneath yellow, with two or sometimes three indistinct black lines. It inhabits New England and the Middle States. *S. cirrigera*, green; remarkable for having two short, fleshy cirri on the snout. It was found in the vicinity of New Orleans. *S. erythronota* (the most common species); blackish, with a broad red stripe on the back. The young are destitute of the red stripe. *S. symmetrica* (Harlan); reddish, with a row of bright orange ocellated spots on each side; length about three inches. The skin of this animal is rough, and apparently destitute of the mucous secretion common to the other species.

Among the aquatic salamanders we shall particularize: *S. dorsalis* (Harlan); resembling the preceding in size and the general distribution of the colors; inhabits South Carolina. *S. maculata;* green, whitish, with numerous round specks of a reddish brown color. *S. ingens;* green; by far the largest species hitherto known; nearly a foot in length. It was discovered in the vicinity of New Orleans.

SALAMIS, or **PITYOUSSA** (modern name KOLURI), an irregularly shaped, mountainous island of ancient Greece, off the coast of Attica. Its area is about 30 square miles; chief town Koluri. It had anciently two principal towns, Old and New Salamis. It is remembered chiefly on account of the great naval battle between the Greeks and Persians, which was fought with great bravery (480 B. C.), a few days after the battle of Thermopylæ, but in which the Persians were entirely defeated.

SAL AMMONIAC, known also as chloride of ammonium, and sometimes as hydrochlorate of ammonia, is used in medicine and in chemistry to a considerable extent. It is obtained from the ammoniacal liquor of the gas works. It is used as an expectorant in chronic bronchitis and pneumonia, as a diuretic, diaphoretic, and alterative in rheumatism, and as an alterative in neuralgia; it is also given in catarrhal conditions of the gastro-intestinal tract and in various hepatic diseases. In chemistry it is largely used as a test. See AMMONIA.

SALANDRA, ANTONIO, an Italian statesman, born in Troia, in 1853. For several years during his earlier life he was a professor of law on the faculty of the University of Rome. He began his political career by being elected to the National Chamber of Deputies from his native city. He was closely associated with Baron Sonnino, who was the bitter opponent of Giolitti. When the World



ANTONIO SALANDRA

War broke out, in 1914, Salandra was Premier, and he, more than any other individual, was responsible for the fact that Italy refused to join the Germanic alliance against the Entente, holding that the treaty which bound Italy to Austria-Hungary was purely for defensive purposes. In May, 1915, on the issue of whether the country was to remain neutral or join the Entente, he resigned, to test popular sentiment. So overwhelming were the demonstrations for his policy that the King was compelled to refuse to accept his resignation, and Italy definitely adopted her pro-Entente policy, which led to her joining forces with France and England. In June, 1916, Premier Salandra resigned.

SALAWATTY, an island off the W. extremity of New Guinea, to the Dutch portion of which it is regarded as belonging; area about 750 square miles. Pop. about 5,000.

SALDANHA BAY, a bay of the Atlantic, on the W. coast of Cape Colony, South Africa, 80 miles N. of Cape Town. It forms a fine natural harbor, with excellent shelter and anchorage at all seasons, but is at present little frequented on account of scarcity of water and fuel.

SALE, in law, that transaction by which the ownership of property is transferred from one person to another in consideration of a money payment made by the buyer to the seller. If it be a commutation of goods for goods, it is more properly an exchange. In order to the validity of a sale, it is necessary that the parties act in good faith; for it is a maxim in law that fraud vitiates all contracts. Neither is a sale valid if the subject-matter of it is illegal or prohibited, or if an essential part of it involves an illegal act. In order to constitute a sale, the consent of each of the parties is required; and hence each must be legally qualified to consent.

SALE, SIR ROBERT HENRY, a British military officer; born in 1782. He entered the army at a very early age, and his brilliant military career supplies some stirring pages in the history of the British Indian empire of the first half of the 19th century. In India, Burma, Afghanistan, wherever he was employed, he distinguished himself, especially in Afghanistan, where he forced Dost Mohammed Khan to surrender, and inflicted a crushing defeat on Akbar Khan at Jalalabad (1842), subsequently assisting in the recapture of Kabul. He died in 1845.

SALEM, a city, port of entry, and one of the county-seats of Essex co., Mass.; on Massachusetts Bay and on the Boston and Maine railroad; 17 miles N. E. of Boston. It contains a State Normal School for Girls, court house, a reformatory, custom house, an orphan asylum, hospital, almshouse, the Peabody Academy of Science, the Essex Institute (in which are a large library and collection of relics and portraits); the East Indian Marine Society, the Salem Atheneum, Plummer Hall, the Essex Southern District Medical Society, the Essex Agricultural Society, the Marine Society, waterworks, electric lights, several National and savings banks, and the first street electric railroad laid in the United States. It has manufactories of glue, furniture, trunks, shoes, jewelry, chemicals, railroad cars, castings, white lead, lead pipe, jute, cordage, leather machinery, leather, and cotton goods. On Jan. 25, 1914, the city was partially burned by a great fire which destroyed over one-third of its most closely built portion, left 15,000 homeless, and caused a loss of $15,000,000.

It quickly recovered, and by 1920 practically all the burned section had been rebuilt. With the exception of Plymouth, Salem is the oldest settlement in New England. It is noted for its many historical interests. Its first house was erected by Roger Conant in 1626, and two years later John Endicott founded the first permanent settlement. The framework of the first church, built in 1634, is still intact. The witchcraft delusion arose here in 1692, and 19 persons were executed because of it. On Oct. 7, 1774, the Massachusetts House of Representatives with John Hancock in the chair met in Salem and declared the independence of that province. On Feb. 14, 1775, the British, in their search for war munitions, were foiled at the North Bridge and forced to withdraw. During the Revolutionary War over 150 privateers sailed from Salem and captured in all 445 English vessels. In 1785 the first vessel from the United States to India and China left this port, and for many years Salem merchants had a monopoly of trade with those countries. Salem is also noted as the birthplace of Nathaniel Hawthorne. Pop. (1910) 43,697; (1920) 42,529.

SALEM, a city and county-seat of Salem co., N. J.; on Salem creek, and on the West Jersey and Seashore railroad; 32 miles S. of Philadelphia. Here are the Tyler public library, a high school, a Friends' meeting house, waterworks, electric lights, National banks, and several weekly newspapers. The city has an iron foundry, oil cloth factory, hosiery mill, a number of vegetable and fruit canneries, and several large glass plants. Pop. (1910) 6,614; (1920) 7,435.

SALEM, a city of Ohio, in Columbiana co. It is on the Pennsylvania and the Youngstown and Ohio railroads. It is the center of an important coal mining region and has manufactures of steel, engines, pumps, tools, motor boats, stoves, furniture, etc. Its notable institutions include a Carnegie library, city hospital, a home for aged women, a municipal building, and a park. Pop. (1910) 8,943; (1920) 10,305.

SALEM, a city, capital of the State of Oregon, and county-seat of Marion co.; on the Willamette river, and on the Southern Pacific, the Oregon Electric, and the Salem Falls City and Western railroads; 50 miles S. of Portland. Here are the State Capitol, the State Institution for Deaf Mutes, the State Institution for the Blind, the State Penitentiary, the State Insane Asylum, the State Reform School, Willamette University, Indian Training School, public library, public hospital, waterworks, street railroads, electric lights, National and State banks, and daily, weekly and monthly periodicals. The city has daily steamer connection with Portland during most of the year. It has foundries, lumber mills, machine shops, and manufactories of sashes and doors, woolen goods, farm tools, and leather goods. Pop. (1910) 14,094; (1920) 17,679.

SALEM WITCHCRAFT. See WITCHCRAFT.

SALERATUS, a salt intermediate in composition between a carbonate and a bicarbonate of potash, prepared from pearl-ash by exposing it to carbonic acid gas; much used in making bread, to neutralize acetic acid, or tartaric acid, and thus render the bread light by the escape of the carbonic acid gas.

SALERNO (ancient Salernum), a city of southern Italy; on the gulf of the same name, 33 miles S. E. of Naples. A hill behind the town is crowned by an old Norman castle. The beautiful Gothic cathedral of St. Matthew (whose bones were brought from Pæstum in 954) was erected by the Normans (1076-1084), and has in front of it a quadrangle of porphyry and granite pillars and inside it monuments of Gregory VII. and Margaret of Durazzo. One of its doors is of bronze, Byzantine work. The city was celebrated in the Middle Ages for its university (founded in 1150, closed in 1817), but especially for its school of medicine (*Schola Salernitana*), which was long the first in Europe. In the neighborhood are the ruins of PÆSTUM (*q. v.*). There are a couple of small harbors. Cotton is spun. Originally a Roman colony (194 B. C.), Salerno figures little in history till after it was taken by Robert Guiscard, who made it his capital. But the removal of the Norman court to Palermo and the sack of the city by the Emperor Henry VI. struck serious blows at its prosperity, and a third came from the decay of the medical school in the 14th century. Pop. about 49,000.

SALERNO, GULF OF, a nearly semicircular indentation, separated from the Bay of Naples by the promontory ending in Point Campanella. On its shores stand Amalfi and Salerno.

SALEYER, or **SALAYER, ISLANDS**, a group of islands in the Indian Ocean; S. of Celebes, from which Great Saleyer is separated by the Saleyer Strait. They are about 70 in number; pop. about 80,000 Mohammedan Malays governed by native rajahs under a Netherlands agent. Ebony, tea, indigo, coffee, earth fruits, and cotton, are among the products.

SALIC, a term applied to a law or code of laws established by the Salian Franks; specifically applied to one chapter of the Salian code regarding succession to certain lands, which was limited to heirs male, to the exclusion of females, chiefly because certain military duties were connected with the holding of those lands. In the 14th century females were excluded from the throne of France by the application of the Salic law to the succession of the crown.

SALICYLATE OF SODA, $2NaC_7H_5O_3$, H_2O; sodium salicylate, prepared by mixing 100 parts of pure salicylic acid with sufficient water to form a paste, and then adding 104 parts of pure sodic carbonate. Like salicylic acid it is a powerful antiseptic, and is frequently added to beers, wines, etc., to preserve them. It is highly recommended as a specific for rheumatism, the dose varying from 10 to 30 grains.

SALICYLIC ACID, in chemistry, $C_7H_6O_3 = \left.\begin{matrix}(C_7H_4O)''\\ H_2\end{matrix}\right\} O_2$, spinoylic acid, ortho-hydroxy-benzoic acid, a dibasic acid existing ready formed in the flowers of *Spiræa ulmaria*, and obtained synthetically by the oxidation of saligenin, or by heating sodium phenol to 180° in a stream of carbon anhydride. Salicylic acid is employed as an antiseptic and antiputrefactive agent. One grain added to each ounce of a fermenting liquid will at once arrest fermentation. It has the power of preserving for a time milk, fresh meat, albumin, etc., and is used in the surgery, either alone or mixed with starch, to destroy the fetid odor of cancerous surfaces or uncleansed wounds.

SALICYLITES, compounds formed by the action of salicylol on metallic oxides and hydrates, those of the alkali metals being moderately soluble in water, the others insoluble. (1) Salicylite of ammonia, $C_7H_5(NH_4)O_2$, obtained by shaking salicylol with strong ammonia at a gentle heat, crystallizes in yellow needles, insoluble in alcohol, and melting at 115°. (2) Salicylite of copper, $C_{14}H_{10}Cu''O_4$, is obtained by agitating an alcoholic solution of salicylol with aqueous cupric acetate. It crystallizes in iridescent green needles, very slightly soluble in water and alcohol.

SALINA, a city, and county-seat of Salina co., Kan.; on the Smoky Hill river, and on the Missouri Pacific, the Union Pacific, the Atchison, Topeka, and Santa Fé, and the Chicago, Rock Island and Pacific railroads; 100 miles W. of Topeka. It contains the Kansas Wesleyan University (M. E.), Normal University, St. John's School (P. E.), street railroads, electric lights, numerous churches, public library, Y. M. C. A. building, National and other banks, and daily and weekly newspapers. Salina has a foundry and machine shops, wholesale stores, paper, flour, and planing mills, and several grain elevators. Near the city are important gypsum quarries and salt springs. Pop. (1910) 9,678; (1920) 15,085.

SALINA FORMATION, a name given in North America to one of the subdivisions of the Silurian system, which appears to be equivalent to the lower portion of the Ludlow rocks of the British series.

SALINAS, a river in California which enters Monterey Bay about 76 miles S. E. of San Francisco. It is 150 miles long.

SALINE, the name of several rivers in the United States. (1) A river in Arkansas, whose source is made up of several tributaries near the N. border of Saline co. Its course is S. E. and S. It crosses Grant Dorsey, and Bradley counties, and flows into the Ouachita river in Bradley co., on its E. limit; length about 200 miles. (2) A river in the S. part of Illinois which flows S. E. between Gallatin and Hardin counties, into the Ohio river, 9 miles S. of Shawneetown. Including its S. fork, it is 100 miles long. (3) A river in Kansas, rising in the W. part of the State, and flowing with an E. course through the counties of Trego, Ellis, Russell, and Lincoln. In Saline co. it flows into the Smoky Hill river 7 miles to the E. of Salina; length, nearly 200 miles.

SALISBURY, a city of Maryland, the county-seat of Wicomico co. It is on the Wicomico river and on the Baltimore, Chesapeake, and Atlantic and the New York, Philadelphia, and Norfolk railroads. It has lumber mills, railroad repair shops, and canning factories. Other industries include the manufacture of flour, fertilizers, shirts and underwear, etc. Its institutions include a hospital and a home for the aged. Pop. (1910) 6,690; (1920) 7,553.

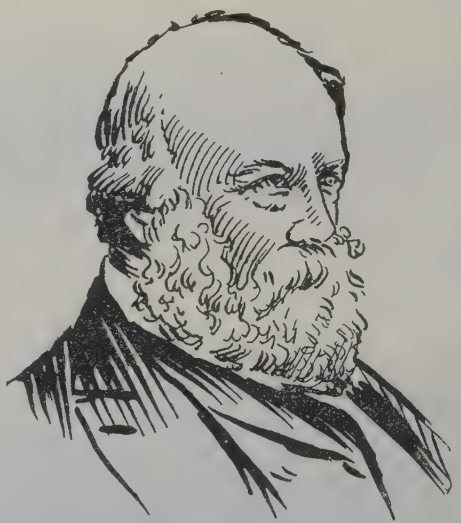
SALISBURY, a city and county-seat of Rowan co., N. C.; on the Southern railroad; 131 miles W. of Raleigh. It is in a mineral and agricultural section; contains Salisbury Normal and Industrial College for Women, Livingstone College for negro students, a State Normal School for Colored Pupils, National and other banks, and several weekly periodicals. It has a woolen mill, machine shops, tobacco factories, etc. Pop. (1910) 7,153; (1920) 13,884.

SALISBURY, or **NEW SARUM**, a cathedral city of England, the capital of

Wiltshire, and a Parliamentary and municipal borough; in a valley near the confluence of the rivers Avon, Bourne, Wily, and Nadder, 84 miles W. S. W. of London. The plan of the city is very regular. Water originally ran through most of the streets, but the streams were covered over after the visitation of the cholera in 1849. The removal from Old Sarum took place in 1220, when the foundations of the new cathedral were laid. It was finally dedicated in 1266. The cathedral consists of a nave of 10 bays, choir, and Lady Chapel, with two aisles, and two transepts, each having a single aisle toward the E., the ground-plan being in the form of a double cross. The whole building is a perfect example of pure Early English style. The spire is the highest in England (406 feet), and leans 27½ inches toward the S. The cathedral was restored by James Wyatt in 1782-1791, and again, beginning in 1863, by Sir Gilbert Scott, Mr. Street, and Sir Arthur Blomfield. There is a curious muniment room over the vestry containing a copy of the Magna Charta of King John. The library, built about 1450, is over the E. side of the cloisters, and contains about 5,000 volumes and many valuable MSS. The outside measurements of the cathedral are: Length 473 feet, width 111 feet; the height of the nave and choir inside is 81 feet. The cathedral stands apart from any other building in the midst of a beautiful close within which stand the bishop's palace, an irregular building begun by Bishop Richard Poore (about 1220) and added to by many of his successors. The parish churches are St. Martin's, St. Thomas of Canterbury, a handsome Perpendicular building of the 15th century, and St. Edmund of Canterbury. The other notable buildings are the council house; the county hall; the infirmary; the "Hall of John Halle" and Audley House, two fine examples of 15th-century domestic architecture; St. Nicholas' Hospital; and the Blackmore Museum, which contains one of the finest collections of prehistoric antiquities in England, the collection from America being probably unrivaled anywhere. The market-place contains statues of the late Lord Herbert of Lea (Sidney Herbert) and Professor Fawcett, who was a native of the city. Here the Duke of Buckingham was beheaded in 1483, when Salisbury was the headquarters of Richard III. The city chiefly depends on its agricultural trade, the former manufactures of cutlery and woolens being extinct. Pop. about 21,500.

John of Salisbury was the confidential adviser of Becket. Margaret, Countess of Salisbury, was the mother of Cardinal Pole. The most notable bishops of Old Sarum were St. Osmund and Bishop Roger; of New Sarum, Hallam (whose death at the Council of Constance, 1417, is regarded by Dean Milman as fatal to many really effective reforms in the Church), Cardinal Campeggio, Jewell, Seth Ward (founder of the Royal Society), Burnet, Hoadley, Sherlock, Douglas, Burgess, Denison, Hamilton, and Moberly. Fox the martyrologist, Hooker, Fuller, Pearson, Isaac Barrow, Joseph Butler, and Liddon have been canons of the cathedral, where George Herbert was a frequent worshiper. Among distinguished natives and residents have been Massinger, William and Henry Lawes, Chiffinch (the chief agent in the intrigues of Charles II.), Harris, the philologist, Chubb "the Deist," and Henry Fawcett. Fielding resided at one time in the close, and Joseph Addison was educated at the grammar school.

SALISBURY, ROBERT ARTHUR TALBOT GASCOYNE-CECIL, THIRD MARQUIS OF, an English statesman; born in Hatfield, Herts, England, Feb. 3, 1830; was educated at Eton and Oxford. As Lord Robert Cecil he entered Parliament as member for Stamford in 1853. and gradually made his way till



MARQUIS OF SALISBURY

in 1866, on the formation of Lord Derby's third administration, he was appointed secretary of state for India. In 1865 he became Lord Cranborne and heir to the marquisate on the death of his elder brother. Owing to differences of opinion on the subject of the franchise he retired from the ministry, but on the death of his father in 1868 and his consequent

elevation to the House of Lords he returned to his old party associations. He resumed the secretaryship for India in the Disraeli government of 1874. He took part in the conference of Constantinople, which was expected to settle the dispute between Russia and Turkey; and at the end of that war, having become foreign minister, he insisted on the treaty which Russia had forced on Turkey being submitted to a congress of the powers. In 1878 he accompanied Disraeli to the congress at Berlin, and on the death of that statesman became the recognized leader of the Conservative party. He became premier as well as foreign secretary on the fall of the Gladstone government in 1885. Gladstone succeeded again to power in the end of the same year, but in the June following was defeated on the Irish bills, when Salisbury again became premier and foreign secretary. His party maintained a majority by means of the adherence of the Liberal Unionists, who were represented in the cabinet by Mr. Goschen. He retired from office in 1892; was recalled on the fall of the Rosebery ministry in 1895, and again retired in 1902. He was always a friend of the United States.

The Hay-Pauncefote treaty for an Isthmian canal was the last important event in which he took an active part. He was for a long time Chancellor of Oxford University. He died Aug. 22, 1903.

SALISBURY, ROLLIN D., an American educator, born at Spring Prairie, Wis., in 1858. He graduated from Beloit College in 1881 and was on the faculty of that institution as professor of biology and geology from 1884 to 1891. He was professor of general and geographic geology at the University of Wisconsin in 1891-2. In the latter year he went to the University of Chicago, where in 1899 he became dean of the Ogden School of Science, and in 1903 head of the department of geography. He also served as assistant United States geologist, from 1882 to 1894. From 1919 he was head of the department of geology at the University of Chicago. His writings include "The Physical Geography of New Jersey" (1898); "The Elements of Geography" (1912); and "Geology" (1914).

SALISBURY PLAIN, in South Wiltshire, England, an undulating tract of chalky down affording splendid pasture for sheep.

SALIVA, the transparent watery fluid secreted by glands connected with the mouth. The quantity secreted in 24 hours varies; its average amount is probably from 1 to 3 ounces. The purposes served by saliva are mechanical and chemical. It keeps the mouth in a due condition of moisture, and by mixing with the food during mastication it makes it a soft pulpy mass such as may be easily swallowed. The chemical action of saliva on the food is to convert the starchy elements into some kind of sugar. The salivary glands are compound tubular glands known as the parotid, the sub-maxillary, and the sub-lingual, and numerous smaller bodies of similar structure, and with separate ducts, which are scattered thickly beneath the mucous membrane of the lips, cheeks, soft palate, and root of the tongue. Salivary glands are absent in some mammals and reptiles, and in most fishes.

SALIVATION, the act or process of exciting or producing an unusual secretion and discharge of saliva, generally by the use of mercury; ptyalism; an abnormally abundant secretion and flow of saliva.

SALIX, the willow, a genus of plants, order *Salicaceæ*. The species found in the United States are numerous, and commonly known as willows, osiers, and swallows. Their timber, though wanting in strength and durability, is applied to many useful purposes; and the wood of the flexible branches and twigs is largely employed for basket-work, hoops, etc. The sage willow, *S. tristis*, a small, downy shrub with a profusion of aments in spring appearing before the leaves, is the most common species in the Northern and Middle States. A peculiar crystalline alkaloid, resembling quinine in its properties, called salicine, has been obtained from the bark, leaves, or flowers of about 20 species of this genus.

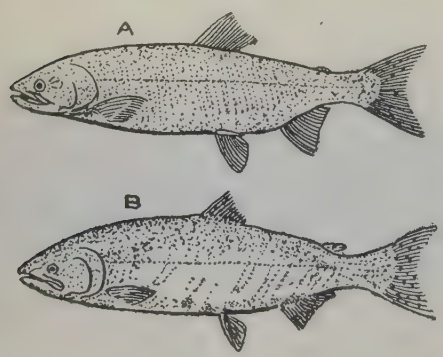
SALLEE, SALI, or **SLA**, a seaport of Morocco; on the Atlantic, at the mouth of the Bu-Ragreb, on the N. side of the river, opposite Rabat. It was for centuries notorious as a haunt of pirates, and gave its name to the Sallee Rovers, who carried the terror of their name into the English Channel, and who are known to every reader of "Robinson Crusoe." Pop. about 20,500.

SALLUST, GAIUS SALLUSTIUS CRISPUS, a Roman historian; born in Amiternum in 86 B. C. He became tribune in 52 B. C., and in the civil war sided with Cæsar. In 47 B. C. he was prætor elect, and in the following year accompanied Cæsar to the African War, where he was left as governor of Numidia. He returned with immense wealth, was accused of maladministration and oppression, and after Cæsar's death lived in luxurious retirement. Sallust wrote several historical works in a clear and concise style. His "Catilinarian War" is a

history of the Catiline conspiracy. The "Jugurtha, or Jugurthine War," is a history of the war against Jugurtha, King of Numidia, from 111 B. C. to 106 B. C. He died in Rome in 34 B. C.

SALLY, a leaping or springing forth. Specifically, a sudden issue or rushing out of troops from a beleaguered place to attack the besiegers; a sortie; as, the garrison made a successful sally. Excursion from the ordinary track; range; deviation; digression; as, to make sallies into a country district. A spring or darting of intellect, fancy, or imagination; flight of liveliness or humor; sprightly exertion of the faculties; as, sallies of wit. Act of levity or extravagance; unseemly display of vivacity; as, sallies of hot-blooded youth.

SALMON (*Salmo salar*), a well-known fish, forming the type of the family *Salmonidæ*. The salmon inhabits both salt and fresh waters, and ranks prominent among the food fishes of the United States and other countries. It generally attains a length of from three to four feet, and an average weight of from 12 to 30



SALMON

A. Humpback Salmon. B. Quinnat Salmon.

pounds. The typical color of the adult fish is a steel-blue on the back and head, becoming lighter on the sides and belly. Teeth are present in the upper and lower jaws, palate, and vomer or roof of the mouth; the edges of the tongue are also toothed or notched. The food consists of animal matter, and must vary with the change of habitat from salt to fresh water, and vice versa.

In the autumn the salmon quits the sea and ascends the rivers for the purpose of spawning, often having to surmount considerable obstacles, such as falls, and artificial structures; "salmon ladders" are placed in some streams to assist their progress. The eggs are deposited in a shallow trough or groove excavated in the gravelly bed of the river. After spawning, the salmon, both male and female, return to the sea under the name of spent fish, foul fish, or kelts, the females being further distinguished as shedders or baggits. In from 70 to 150 days the young fish emerges from the egg, and in its embryo state it is not unlike a tadpole, being on the average about one and a quarter inches in length. About 50 days later it assumes the appearance of a fish. It usually continues in the shallows of its native stream for two years after hatching. When the season of its migration arrives, generally between March and June, the fins have become darker and the fish has assumed a silvery hue. It is now known as a "smolt" or "Salmon fry." The smolts now congregate into shoals and proceed leisurely seaward. On reaching the estuary they remain in its brackish water for a short time and then make for the open sea. The salmon returns, as a rule, to the river in which it passed its earlier existence. The fertility of the fish is enormous; it has been calculated that over 150,000,000 of salmon ova are annually deposited in the Scotch river Tay alone.

For purposes of commercial supply, salmon are taken in nets of special construction and of various forms, the fishings being regulated by law. Stake nets supported on piles of wood and extending out into the sea, and "bag" or "drift" nets are the means most frequently employed in the British salmon fishery. The chief European salmon fisheries are those of the Tweed, Tay, North Esk, Dee, Spey, Severn, and some Irish rivers; there are important fisheries in some European and North American rivers. Immense quantities of salmon are annually taken and canned on the Columbia and Frazer rivers.

Of the same genus as the common salmon is the salmon trout, the common river trout, Lochleven trout, etc. What is known as the "land-locked" salmon, which is found in Norway, Sweden, Maine, and New Brunswick, is so called because it remains in inland waters and does not descend to the sea. In the waters of Northwestern America are several salmon belonging to a distinct genus, *Oncorhynchus*, including the quinnat or king salmon, blue-black salmon or red fish, silver salmon, dog salmon, and humpback salmon. The quinnat (*O. tchawytscha*) has an average weight of 22 pounds. Both it and the blue-back salmon (*O. nerka*) are caught in immense numbers in the Columbia, Sacramento, and Frazer (especially in spring), and are preserved by canning. Attempts have been made to introduce the quinnat into eastern North America and Europe. The

salmon is one of the fishes that are important objects of FISH CULTURE (*q. v.*). In 1918 the salmon catch in Alaska was 6,605,835 cases. 27,969 persons were employed. In 1919 4,583,688 cases of canned salmon were produced.

SALMON TROUT, the *Salmo trutta*, a north European fish, much more common in Scotland than in England. Its habits are those of the salmon. It attains a length of about three feet; upper parts blackish, usually with a purplish tinge on the silvery sides, under part silvery. Called also sea trout, and in Wales and Ireland white trout. The flesh is pink, richly flavored, and much esteemed. Also the namaycush, or large lake trout of North America.

SALOL, a white crystalline powder, obtained from phenol and salicylic acid. It is slightly greasy to the touch and tasteless. It is almost insoluble in water, but soluble in alcohol. It is a powerful antipyretic and antiseptic.

SALONA, an ancient and now ruined city of Dalmatia; at the head of a gulf of the Adriatic, about 3 miles N. E. of the spot on which Diocletian afterward built his gigantic palace of Spalato. It was made a Roman colony in 78 B. C., and later became the capital of Dalmatia and one of the most important cities and seaports of provincial Rome. But it was frequently captured by the Goths and other barbarians, and in 639 was completely destroyed by the Avars. The inhabitants who escaped took refuge in Hadrian's palace. The ruins were excavated during the 19th century; there are now to be seen remains of the former walls, the shell of the ancient Christian cathedral, traces of an amphitheater, and other structures. The city was early made the seat of a bishop, who was soon advanced to the dignity of archbishop of all Dalmatia. After the destruction of the city the archbishop converted the temple of Jupiter at Spalato into his cathedral.

SALONICA, or **SALONIKI** (ancient Thessalonica; Turkish, Selanik), a large seaport, formerly belonging to Turkey, and awarded to Greece by the treaty with Turkey, following the World War; on a gulf of the Ægean Sea, 315 miles W. S. W. of Constantinople, rising from the sea in the form of an amphitheater, and forming a mixture of squalor and splendor. In Salonica may still be seen vestiges of Cyclopean and Hellenic walls, triumphal arches, and remains of Roman temples, Byzantine structures, and Venetian castles. Its harbor is excellent and its roadstead well sheltered. The principal exports are cotton, corn, tobacco, timber, and wool; imports, sugar, coffee, indigo, calicoes, etc. The manufactures include cotton, silk, leather, carpets, etc. Thessalonica was founded on the site of an older town in 315 B. C., and had a somewhat eventful history. St. Paul preached the Gospel here, and addressed two of his epistles to the Christian converts of the place. In the first Balkan War the Turks surrendered the city and an army of 29,000, to the Greeks on May 8, 1912. During the World War, Greece, having failed to fulfill the terms of her treaty with Serbia against Bulgaria, Salonica was occupied by the Allies. In August, 1917, a disastrous fire ruined two-thirds of the city and made 100,000 persons homeless. Salonica became the military base for the Allies in the Balkans for their operations against the Bulgars which culminated in the surrender of Bulgaria in 1918. See WORLD WAR. Pop. (1919) 250,000 civilians.

SALONICA, GULF OF (ancient Sinus Thermaicus), the extreme N. W. arm of the Ægean Sea, between Thessaly on the W., Macedonia on the N. W., and Chalcidice on the E. It is formed of two distinct parts, one of which is very wide, and lies S. E. and N. W.; the other, which is narrow, lies S. W. and N. E., and is about 60 miles long.

SALPA, a genus of ascidian or tunicate mollusca forming the representative example of the family *Salpidæ*. These animals are found floating in the Mediterranean and the warmer parts of the ocean, and are protected by a transparent gelatinous coat, perforated for the passage of water at both extremities. They are frequently phosphorescent, and are met with in two conditions known as single and chain salpæ. Each salpa is of oval or quadrate form, and the organs of the body occupy a comparatively small space within the body-cavity. *S. maxima* is the most familiar species.

SALSETTE, an island N. of Bombay, British India, with which it is connected by a bridge and a causeway. It is a beautiful island, diversified by mountain and hill, studded with the ruins of Portuguese churches, convents, and villas, and rich in extensive rice fields, cocoanut groves, and palm trees; area, 240 square miles; pop. 150,000; chief town, Thana. Nearly 100 caves and cave-temples exist at Kánhari or Keneri, in the middle of the island, 5 miles W. of Thana. They are excavated in the face of a single hill, and contain elaborate carvings chiefly representations of Buddha, many of colossal size. There are caves in other localities besides those at Kánhari—*e. g.*, at Montpezir, Kanduti, Amboli, etc. It was occupied by the Portuguese early in the

16th century, and was captured by the Mahrattas in 1739 and by the British in 1774.

SALSIFY, or **SALSAFY**, the *Tragopogon Porrifolius*, commonly called oyster plant, cultivated to a small extent in England, but much more largely on the continent of Europe and in the United States. The root is excellent when cooked.

SAL-SODA the commercial term for impure carbonate of soda.

SALT, in chemistry, sodium chloride. In the plural it is applied in a general sense to compounds of a metal and a halogen, as sodium chloride, NaCl; and to compounds formed by the union of an acid and a base, nitrate of silver $AgNO_3$. In its fuller signification the term suggests a compound which can suffer rapid double decomposition with another soluble substance, as when solutions of chloride of sodium and nitrate of silver are mixed together they at once decompose each other and form chloride of silver and nitrate of sodium. By an extension of meaning the name is sometimes applied to compounds, as chloride of ethyl, acetate of ethyl, and even to fats, as stearin, tristearate of glycerin. Popularly and medicinally the term salts refers to Epsom and Rochelle salts.

Salt as a commercial product is a very important industry in the United States. As early as 1620 the Jamestown colonists of Virginia established salt works at Cape Charles. Rock salt is abundant in West Virginia and Louisiana, and salt "licks" and springs are found in nearly all the States and Territories. The springs of southern Illinois were worked by the French and Indians in 1720. The Kentucky salt springs were known and used before 1790.

Salt production in the United States, (1918) 7,238,744 short tons, valued at $26,940,361. The principal salt-producing states are New York, Michigan, Kansas, Ohio and California.

SALTA, a province of the Argentine Republic, touching Chile and Bolivia, and nearly inclosing the province of Jujuy. Minerals are abundant, but have been neglected for agriculture and cattle-raising. Salta is watered by the Salado, San Francisco, and Bermejo; area, 48,302 square miles. Pop. (1919) 150,796. SALTA, the capital, on the Rio Arias, 535 miles N. by W. of Córdoba, was founded in 1582; it is the seat of an archbishop, and has a seminary for priests, a national college, and a normal school for girls. Pop. (1918) 28,436.

SALT CAKE, sulphate of soda, in its prepared form, for the use of glass blowers and soap manufacturers.

SALTILLO, capital of the Mexican State of Coahuila; 237 miles S. W. of Laredo, Texas, and 400 N. by W. of Mexico City. It contains several convents, a small fort, a bull ring, a number of cotton factories and pulque distilleries. Pop. about 35,000.

SALTIRE, or **SALTIER**, in heraldry, an ordinary in the form of a St. Andrew's cross, or the letter X, formed by two bends, dexter and sinister, crossing each other.

SALT LAKE CITY, a city of Utah, the capital of the State and the county-seat of Salt Lake co. It is on the Great Salt Lake and Hot Springs, and on the Oregon Short Line, the Los Angeles and Salt Lake, the Denver and Rio Grande, the Western Pacific, Union Pacific, and other railroads. It is built at the base of the Wasatch Mountains, and has an altitude of 4,334 feet above sea-level. The valley in which the city is located is famous for its beauty, resources, climate, and health-giving properties. The city has a total area of 51.53 square miles. Its streets are among the widest and best planned in the world. Hundreds of miles of fine roads lead from the city to the beautiful canyons of the Wasatch Mountains. In 1920 an extensive network of boulevards was under construction. The drives around the city are among the most beautiful in America.

The city has over 280 miles of sewers, 161 miles of gas mains, 73 miles of paved streets, 460 miles of graded streets, and 387 miles of water main. Electric light and power are furnished by water power from the mountain streams. There are within the city limits 13 parks, comprising 200 acres.

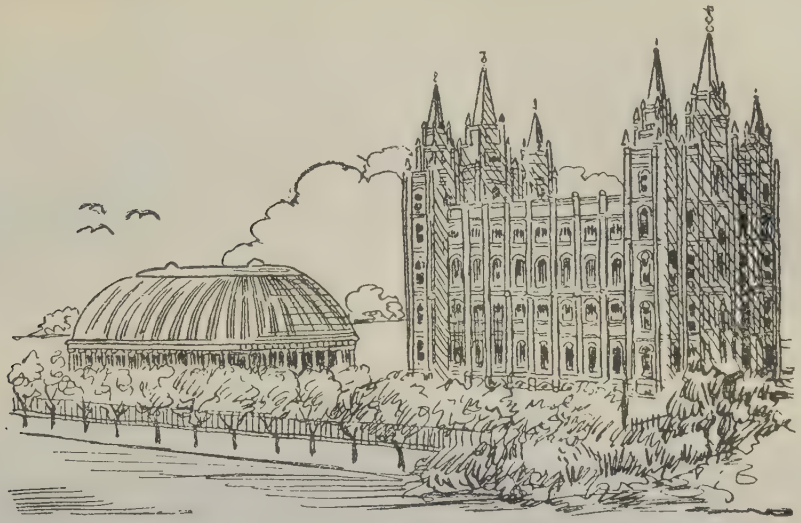
The school system is unusually efficient. There are 49 public school buildings with 25,000 children in attendance.

Salt Lake City is an important manufacturing center. Its annual product is valued at about $75,000,000. Among the most important industries are its smelters of copper, lead, and zinc, sugar refining, the manufacture of canned goods, candy, and chemicals.

There were in 1920 12 banks, with a capital of 4,850,000, deposits of $71,000,000 and a surplus of $2,120,230. The bank clearings for 1919 amounted to $825,366,260. Among the most notable buildings are the Mormon Tabernacle, the State Capitol, Federal Building, University of Utah, and many handsome churches, theaters, and clubs.

The institutions for higher education

include the University of Utah, Latter Day Saints University, and many private and theological institutions. The city was



TABERNACLE AND TEMPLE, SALT LAKE CITY

founded by Brigham Young in 1847. Pop. (1900) 53,531; (1910) 92,777; (1920) 118,110.

SALT LICK, a knob lick; a place where salt is found on the surface of the earth, to which wild animals resort to lick it up; sometimes near salt springs.

SALT MARSH, land under pasture grasses or herbage plants, near the sea, and liable to be overflowed by it, or by the waters of estuaries, and in consequence more or less impregnated with salt.

SALTON SEA, a remarkable temporary lake formed in southern California, in 1905 and 1906, by the overflow of water from the Colorado river. The water ran through the water channel of an irrigation canal which conducted water from the Colorado river near Yuma, Ariz., to the Imperial Valley region. The land here forming the Salton basin is below sea-level and when the water was deflected from the natural channel of the river which normally emptied into the Gulf of California, an area of over 400 square miles was flooded and over 2,000 square miles were threatened. Unsuccessful attempts were made to restore the Colorado river into its original channel, but the overflow was not controlled until February, 1907, when three trestles were constructed across the break, from which stones were dumped. By this means the lake was checked and gradually disappeared. In 1910 the second break occurred, and this was closed in a manner similar to the first. The successive flooding and evaporation from this area afforded unique opportunity for biologists and botanists to study the effects under such conditions.

SALTPETER, or **SALTPETRE**, in chemistry KNO_3, potassium nitrate or niter; found in dry and hot countries as a natural product, but prepared artificially by exposing a mixture of calcareous soil and animal matter to the atmosphere, or by decomposing native sodium nitrate with potassium carbonate. It is chiefly used in the manufacture of gunpowder, fireworks, and nitric acid. When fused and poured into molds, it forms the sal prunella of commerce.

SALT RANGE, a mountain system in the Punjab, India, consisting of two main chains which run E. and W., and embrace between them an elevated table-land. It begins on the S. side of the Jhelum, runs W. to the Indus, and varies from 3,200 to 5,000 feet in height. Its appearance is exceedingly bleak and barren, but not without much savage grandeur. The system gets its name from the inexhaustible beds of rock salt that occur on the edges of the plateau. About 60,000 tons are extracted annually, four-fifths from the Mayo mines, a few miles N. E. of Pind Dadan Khan. Coal and other minerals also occur.

SALT RIVER, a river in Kentucky, formed of three branches, the Rolling Fork, East Fork, and Beech river. It is in the N. part of the State and joins the

Ohio 19 miles S. W. of Louisville. The first and third branches unite about 11 miles N. E. of Elizabethtown. The source of the East Fork, or Salt river proper, is in Boyle co., and its course is N. through Mercer co., turning to the W. in Spencer co., and continuing through Bullitt co. in the same direction, uniting with Rolling Fork or Salt river 9 miles to the S. W. of Shepherdsville. The main river flows into the Ohio river at West Point, about 10 miles from the juncture of Rolling and East Forks. It is more than 100 miles long.

Another Salt river is in northeastern Missouri, formed of three branches or forks, called North, Middle, and South Forks. The North Fork is the main river; its source is in Schuyler co. and its course is S. by S. E. until it reaches Monroe co., where it turns toward the E., then traverses Ralls co., and in Pike co. flows into the Mississippi 2 miles above the border of Louisiana. The source of Middle Fork is in Macon co., and it flows S., entering Salt river, the main fork, at Florida. The South Fork flows N., intersecting Audrain co., and unites with the Middle Fork 3 miles S. W. of Florida. This Salt river is 200 miles long.

SALTUS, EDGAR EVERSTON, an American novelist; born in New York, June 8, 1858. He was educated in Europe and graduated at the Columbia Law School. Among his works may be mentioned: "The Philosophy of Disenchantment" (1885); "The Anatomy of Negation" (1886); "Mr. Incoul's Misadventure" (1887); "The Truth about Tristrem Varick" (1888); "Eden" (1888); "A Transaction in Hearts" (1889); "The Pace That Kills" (1889); "A Transient Guest" (1889); "Mary Magdalen" (1892); "Imperial Purple" (1892); "Enthralled" (1894); "When Dreams Come True" (1895); "The Yellow Fay" (1905); "Daughters of the Rich" (1909); "The Crimson Curtain" (1916); "The Palliser Case" (1919).

SALTWORT, the *Salsola,* a genus of plants of the natural order *Chenopodiaceæ,* having hermaphrodite flowers, with five-parted perianth and a transverse appendage at the base of each of its segments, five stamens and two styles, the seed with a simple integument. The species are numerous, mostly natives of salt marshes and sea-shores, widely diffused. One only, the prickly saltwort (*S. kali*), is found in Great Britain. The plant is annual, with prostrate much-branched stems, awl-shaped spine-pointed leaves, and axillary solitary greenish flowers. It was formerly collected in considerable quantities on the W. shores of Great Britain, to be burned for the sake of the soda which it thus yields. *S. sativa* is the chief barilla plant of the S. of the country of Spain.

SALUS, the Roman goddess of health, public prosperity, etc.

SALUTATION, a sign which custom has rendered common, for expressing to others, in our intercourse with them, our esteem, love, submission, or good will. Greeting (in German, *gruss, grüssen*), is derived from the Low German *gröten,* to make great: thus "God greet you," means, "God make you great—bless you." Salutation sometimes consists of certain gestures. Sometimes an express assurance or wish is added to these mute signs of feeling. The difference in the forms of salutation often extends so far that one nation considers that a mark of rudeness which another esteems a mark of civility.

The military salutations which were introduced among the Germans in the beginning of the 16th century consist in touching the hat or cap, lowering the standards and the sword, or raising the musket. Vessels, when meeting, salute each other by a discharge of cannon, by striking the flag, or by the cheers of the sailors, etc.

SALUTES, MILITARY. All officers salute on meeting and on making or receiving official reports. Military courtesy requires the junior to salute first or, when the salute is introductory to a report made at a military ceremony or formation to the representative of a common superior, as, for example, to the adjutant or officer of the day, the officer making the report, whatever his rank may be, is required to salute first; the officer to whom the report is made will acknowledge by saluting that he has received and understood it. When under arms the salute is made with the sword or saber if drawn, otherwise with the hand, and a mounted officer always dismounts before addressing a superior who is not mounted. On official occasions officers, when indoors and under arms, do not uncover, but salute with the sword, if drawn, and otherwise with the hand. If not under arms they uncover and stand at attention, but do not salute except when making or receiving a report.

When an enlisted man without arms passes an officer he salutes with the hand farthest from the officer, but if mounted he salutes with the right hand, and officers are to be saluted whether in uniform or not. When armed with the saber and out of ranks an enlisted man salutes with the saber, if drawn, but otherwise with the hand. If on foot and armed with a rifle or carbine he salutes with his weapon. A

mounted soldier dismounts before addressing an officer not mounted. An enlisted man, if seated, rises on the approach of an officer, faces him and salutes; if standing he faces the officer for the same purpose. If both remain in the same place or on the same ground such compliments need not be repeated, and soldiers, if at work, do not cease work to salute an officer unless addressed by him. Before addressing an officer an enlisted man salutes as prescribed, and he also makes the same salute after receiving a reply. Indoors and unarmed an enlisted man uncovers and stands at attention on the approach of an officer. He does not salute unless he addresses or is addressed by the officer. If armed he salutes as though outdoors.

When an officer enters a room where there are soldiers the word "attention" is given by someone who perceives him, when all rise and remain standing in the position of soldier till the officer leaves the room; but soldiers at meals do not rise. Officers are required at all times to acknowledge courtesies of enlisted men by returning salutes given, and when several officers in company are saluted, all who are entitled to the salute return it.

SALUTES WITH CANNON. Salute to the Union. This is one gun for each State, and is commemorative of the Declaration of Independence. It is fired at noon of the Fourth of July at every military post and on board commissioned naval vessels belonging to the United States. The National Salute, 21 guns. This is the salute for the National flag, the President of the United States, presidents of foreign republics or sovereigns of foreign states visiting the United States. Vice-President of the United States, American and foreign ambassadors, 19 guns. The president of the Senate, speaker of the House of Representatives, members of the cabinet, the chief-justice, a congressional committee, governors within their respective States or Territories, viceroy or governor-general of provinces belonging to foreign states, general of the army, admiral of the navy, and same ranks in foreign armies and navies, 17 guns. American or foreign envoys, or ministers plenipotentiary, assistant Secretaries of the Navy or War, lieutenant-general, or a major-general commanding the army, and corresponding ranks in the navy and foreign armies and navies, 15 guns. Ministers-resident accredited to the United States, major-general, rear-admiral, and corresponding ranks of foreign armies and navies, 13 guns. Chargés d'affaires, brigadier-general, commodore, and corresponding ranks in foreign armies and navies, 11 guns. Consuls-general accredited to the United States, 9 guns.

Salutes are only fired between sunrise and sunset, and not on Sundays, except in international courtesies. The national colors are always displayed at the time of saluting. The salute to the flag is the only salute which is returned, and this must be done within 24 hours. United States vessels do not return the salute to the flag in United States waters if there is any fort or battery there to do it. Nor do United States vessels salute United States forts or posts.

If there are several batteries or forts within sight or 6 miles of each other, one of them is designated as the saluting fort, and returns all salutes of foreign men-of-war. In New York, Castle William, on Governor's Island, is the saluting fort.

SALVADOR, or SAN SALVADOR, a republic in Central America; on the coast of the Pacific; and bounded by Honduras on the N. and E., and by Guatemala on the N. W.; area, 13,176. Pop. (1919), estimated, 1,298,621; Spanish-speaking Indians and half-breeds. A range of volcanic peaks, varying in height from 4,000 to 9,000 feet, runs through the center of the country, dividing an interior valley from the lowlands on the coast. The largest river is the Lempe, which is only navigable in parts. The soil is remarkably fertile. Sugar, tobacco, cotton, etc., also thrive. Cattle-breeding is carried on, but not extensively. The manufactures are unimportant. The imports in 1918 were valued at £1,228,539, and the exports £2,479,960. Trade is chiefly with the United States, Great Britain, and France. The chief articles of import are cottons, hardware, flour, drugs and chemical products. The chief exports are coffee, indigo, and sugar. Cotton growing has been developed in recent years. The established religion is Roman Catholicism. The government is carried on by a president and four ministers. There is a congress of 70 deputies elected by universal suffrage. The inhabitants had long the reputation of being the most industrious in Central America, and the State, in proportion to its size, is still the most densely peopled. Salvador remained under Spanish rule till 1821, when it asserted its independence and joined the Mexican Confederation. In 1823, however, it seceded from the confederation and subsequently formed part of the Republic of Central America. In 1853 it became an independent republic. Its progress has been much hindered by internal dissensions, revolutions and counter-revolutions following each other without end. The capital is San Salvador.

History.—In 1913 President Aranjo

was killed by an assassin and on the expiration of the term for which he had been elected, Carlos Melendez was in 1915 elected president for the term 1915 to 1919. He at once addressed himself to improving the finances of the country, and in this he met with some success. When the United States entered the war with Germany, the Government proclaimed its neutrality, but explained that its attitude was friendly toward the United States, and in proof of this offered the use of the ports of the country to the United States. In March, 1920, Salvador joined the League of Nations, and at the same time revived a scheme for a central federation or union of the five Central American republics under one governor, such a union to take place on Sept. 15, 1921. An exceptional large crop in 1920 made the year the most prosperous of this country. The coffee harvest was estimated at 100,000,000 pounds. A moratorium, which had been in operation since the beginning of the World War, terminated on June 28, 1920. Congress on Aug. 27, 1920, passed a resolution favoring the political unity of the five republics.

SALVADORA, a genus of plants, type of a natural order (*Salvadoraceæ*) of monopetalous dicotyledons, allied to *Oleaceæ* and *Jasminaceæ*. They have stems with slightly swollen joints, opposite entire leaves, and loose branching panicles of small flowers. *S. persica* is supposed to be the mustard tree of Scripture, which has very small seeds and grows into a tree. Its fruit is succulent and tastes like garden cress. The bark of the root is acrid.

SALVAGE, the act of saving a ship or goods from extraordinary danger, as from fire, the sea, an enemy, pirates, or the like. In commercial and maritime law: (1) A payment or compensation to which those persons are entitled who have by their voluntary efforts saved ships or goods from extraordinary danger, as from fire, the sea, an enemy, pirates, or the like. The amount of salvage to be paid is generally agreed on between the salvors and the owners of the property salved; but if they cannot agree, the sum to be paid, and the proportions in which it shall be paid, are determined by the Admiralty Court. The crew of a ship are not entitled to any salvage for any extraordinary efforts they may make in saving their own vessel. (2) The property saved from extraordinary danger by the voluntary efforts of the salvors.

SALVARSAN, Arseno-benzol, "606," an organic compound containing arsenic, first prepared by Ehrlich and Hata in 1907, its full chemical name being dioxydiamido-arseno-benzol dihydrochloride. It is a specific in the treatment of syphilis and other diseases. It is administered intravenously, or injected into the muscles. The latter method is considered more effective, but it produces much pain, and the intravenous method is that generally adopted. The drug is very effective in the early stages of the disease, two or three doses usually affecting a cure within six months. In the secondary stage the disease can be cured in from six months to a year, and most cases even further developed yield to prolonged treatment.

Neo-salvarsan was prepared by Ehrlich in 1912, in consequence of occasional undesirable results following the injection of salvarsan. It is a combination of salvarsan with sodium formaldehyde-sulphoxalate, and while less toxic than salvarsan is generally considered less potent, although it is claimed for it that its effects, although slower, are more lasting. It contains about two-thirds as much arsenic as salvarsan, and occurs as a yellow powder, which is dissolved in distilled water immediately before being injected.

SALVATION, the act of saving; rescue or preservation from danger, great calamity, or total destruction; as, marrying money was his salvation. In theology, the deliverance wrought out by Christ for mankind, saving them from the consequences of their sins.

SALVATION ARMY, an organization, formed on the model of an army, for evangelizing the masses in large cities; originally known as the Christian Mission; founded at Mile End, London, by the Rev. William Booth, July 5, 1865. From 1872 to the present the movement has spread and is now represented in 66 countries. In 1918 there were 10,591 corps and outposts, 1,246 social institutions, 17,476 officers and cadets, 68,676 local officers, and 31,400 bandsmen. The organization issued 76 periodicals with 1,210,000 total copies per issue. The total number of its social institutions was 1,246, including food depots, shelters, industrial homes, labor bureaus, inebriates' homes, children's homes, rescue homes, and maternity homes. Almost 6,500,000 beds and 17,500,000 meals were supplied. The labor bureaus received 82,475 applications for work and found 75,730 situations.

In 1919, in the United States, there were 1,000 corps and outposts; 3,000 officers and cadets; 75 hotels; 92 industrial homes; 11 slum posts and nurseries; 25 rescue homes and maternity hospitals. In 1919, $14,000,000 was subscribed. In all the large cities of the United States

Christmas dinners are provided for the poor and needy. Evangeline Booth is the Commander-in-Chief in the United States. The international offices are in London, England. William Bramwell Booth, eldest son of the founder, is general of the entire organization. During the World War the very extensive welfare work for soldiers and sailors and their families, undertaken both at the fronts and at home, was notably successful. See RELIEF, WAR.

SALVE, that which saves, mitigates, relieves, or preserves; a help; a remedy; an aid; an antidote; as, heavy damages proved a salve to his dishonor. Also an adhesive composition; a substance applied to heal, mollify, or relieve wounds or sores; an unguent; an ointment; a plaster.

SALVIA, sage; the typical genus of the *Salvidæ*. Calyx two-lipped; stamens two, forked. Undershrubs or herbs, widely distributed. Known species about 400, many of them very showy, flowering plants, cultivated in gardens or in greenhouses. *S. officinalis*, of which there are many varieties, is the common sage, a well-known culinary herb (see SAGE). It is a feeble tonic and astringent and an efficient aromatic. *S. grandiflora* is also culinary. The galls of *S. pomifera* are eaten in Candia, as are the stalks of *S. moorcroftiana* in the Himalayas. The root is used in cough, the seeds as an emetic, and the leaves as a medicine in guinea-worm and itch, or as a poultice to wounds. The seeds of *S. plebeia* and *S. pumila*, also Indian species, are given in gonorrhœa, etc.

SALVINI, TOMMASO, an Italian tragedian; born in Milan, Jan. 1, 1830. His father and mother were both actors; he was trained under Modena, a distinguished player; and became well known as a member of Ristori's company. In 1849 he fought with distinction in the revolutionary war; and returning to the stage played with eminent success as Œdipus in a play written for Salvini by Nicolini, and as Saul in Alfieri's drama. In Paris he played in these, in Racine's plays, and as Shakespeare's Othello—the part with which he is identified in the minds of English playgoers. He scored successes in Brussels and Madrid, and visited the United States in 1874, England in 1875, with as great *éclat*. But after another visit to the United States in 1890, he retired from the stage to enjoy a life of earned leisure in his villa near Florence. Among his most striking parts were—besides Othello—Hamlet, Macbeth, and Lear. He died in 1916.

SAL VOLATILE, carbonate of ammonia. The name is also applied to a spirituous solution of carbonate of ammonia flavored with aromatics.

SALWIN, SALWEEN, or SALWEN, a river of Burma with a general N. and S. course parallel to the Irrawady, rising in southwestern China, and falling into the Indian Ocean (Gulf of Martaban), the towns of Martaban, Moulmein, and Amherst being at or near its mouth. The river course is interrupted by rocks and rapids, but vessels of the largest size can reach Moulmein. Vast quantities of teak are annually floated down the Salwin and shipped at Moulmein for export. The area of the Salwin basin is 62,700 square miles; the river is 1,750 miles in length, and from 1 to 4 miles in breadth.

SALZBRUNN, a group of three villages (New, Lower, and Upper Salzbrunn) in Silesia; 30 miles S. W. of Breslau; having eight mineral springs, which attract many visitors in the season. The water is alkalo-saline; it is extensively exported. There are glass and porcelain factories, yarn-spinning works, brick works, and coal mines.

SALZBURG, a city of Austria, capital of the province of Salzburg, picturesquely situated on both banks of the rapid Salza, which is here hemmed in between two isolated hills, 73 miles S. E. of Munich. It is partly walled, and has several handsome squares and streets, ornamental grounds, park, and river promenades. The principal edifices are the cathedral (1614–1668) built in imitation of St. Peter's, Rome, several other churches; the archbishop's palace (now belonging to the town), former imperial palace, exchange, museum, and several benevolent institutions. It was the birthplace of Mozart, and there is a bronze statue of the composer by Schwanthaler. There is a theological college, and other high-class educational institutions, extensive libraries, etc. The manufactures before the World War were not individually of importance. The town was the see of a bishop in the 7th century, which in 798 was raised to an archbishopric. The Bishops of Salzburg were princes of the German empire, and held the position of sovereigns over the archbishopric till it was secularized in 1802. Pop. about 37,300. The province of Salzburg, area 2,767 square miles, is a mountainous country, intersected by numerous valleys, chiefly pastoral, but in many of them much corn and fruit are raised. Wood is abundant, and the minerals, which are very valuable, include gold, silver, lead, copper, cobalt, iron, salt, and marble. Pop. about 219,000.

SALZKAMMERGUT, called the Austrian Switzerland, one of the most picturesque districts of Europe; between the Austrian province of Salzburg on the W. and Styria on the E.; area, about 250 square miles. The scenery combines in rare beauty the features of valley, mountain, and lake. The highest peak, the Dachstein, reaches an altitude of 9,830 feet. But the district derives its principal attraction from its lakes, the most famous of which are Hallstatt, Traun or Gmunden, Atter, St. Wolfgang or Aber, Mond, and Zell. It derives its name of "Salt-exchequer Property" from its salt springs and mines, which yield over 80,000 tons of salt annually. The chief seats of the salt works are Ischl, Hallstatt, and Ebensee. Little or no agriculture is carried on; the inhabitants not engaged in the salt industry are employed in cattle breeding and in the timber trade.

SAMAR, the third largest of the Philippine Islands; S. E. of the E. part of the Island of Luzon, from which it is separated by the Strait of San Bernardino; and the extreme E. of the Visayan group. On the S. W. it is separated from the island of Leyte by the Strait of San Juanico. The W. coast is bounded by the Western Sea, and the E. coast by the Pacific Ocean. The island is mainly mountainous, although there are many fine valleys under cultivation. Samar extends 130 miles from N. W. to S. E., 50 miles from the E. to W., and has an area with adjacent islands of 5,031 square miles. Pop. about 266,237. Samar and islands adjoining were made a province under civil government in 1902. The products of the island are such as are found in all the archipelago. There are many fine kinds of woods, numerous varieties of wild fruits, various kinds of bamboo, roots suitable for food, rattan, game, and fish. Besides cocoanuts there is a large production of oil, rice and hemp.

SAMARA, a town in Russia, capital of the province of the same name, in eastern Russia. It is situated at the juncture of the rivers Volga and Samara, 550 miles southeast of Moscow. It is the center of an extensive grain producing region and its chief industry before the World War was flour milling. Pop. about 145,000. The province has an area of 59,000 square miles, and about 4,000,000 inhabitants, many of whom are descendants of German colonists.

SAMARANG, a seaport of Java, 255 miles E. of Batavia, the principal port for the trade of Middle Java. Since 1873 it has been connected with Jokjokarta and Surabaya by railway. The European quarters have all the appearance of a typical Dutch town. The more important buildings are a military hospital, the city hall, and Christian churches and schools. A fort and a coast battery provide defense for the town. The river is silted up at its mouth; but a canal, constructed in 1879, serves as a harbor. The roadstead is exposed during the W. monsoon. Pop. (1918) 106,852.

SAMARCAND, a city of Turkestan; in the valley of the Zerafshan; about 4 miles S. of that river, and among the W. spurs of the Tian-Shan Mountains; 130 miles E. by S. of Bokhara and 150 miles N. by E. of Balkh in Afghanistan. It is the ancient Marcanda, the capital of Sogdiana, which was taken and destroyed by Alexander the Great. It was again captured in A. D. 712 by the Arabs, who supplanted the Græco-Bactrian civilization, of which it was the center, by the creed and customs of Islam. Ever since that time it has been a sacred city in the eyes of the Moslems, especially after the conqueror Timur made it the capital of his kingdom in the 14th century. It had, however, suffered terribly from Genghis Khan, who took it (1219) and destroyed three-fourths of its 500,000 inhabitants. In Timur's time it had a population of 150,000. The Ulug-beg, the graves of Timur and his wives, as well as the tomb of one of the Prophet's companions, and two other colleges, the Tilla-Kari and Shir-rar, both dating from the beginning of the 17th century, are magnificent structures, grandly decorated. In the 15th century Samarcand was renowned as a school of astronomy and mathematics. After the decay of Timur's empire the city had a checkered history, figuring in most of the wars that raged in that region till at last it fell into the hands of the emirs of Bokhara, from whom it was taken by the Russians in 1868. They established themselves in the citadel, built on a steep hill 4 miles in circuit, and laid out a new town, with broad and handsome streets, to the W. of it. On the other side of the citadel is the old city, walled, with dark and narrow streets and dirty houses. The ruins of still more ancient Samarcands extend for 3 miles or more to the W. and N. of both the Russian and the native town. The people carry on gardening, their gardens being irrigated by water drawn off from the Zerafshan, and the manufacture of textiles, harness, gold and silver wares, leather, pottery, boots, etc., and conduct a brisk trade in cotton, silk, fruits, wheat, rice, salt, and horses. Pop. about 98,000.

SAMARIA, a city and country of Palestine; situated toward the N. of Judea. Samaria was the country in which

the 10 revolted tribes raised their independent state and formed the kingdom properly denominated Israel, in contradistinction to that of Judah, embracing the two tribes of Judah and Benjamin, from which the other 10 had seceded when, refusing the authority of Rehoboam, they established a dynasty of their own, at the head of which they placed Jeroboam, the first king of the nation of Israel. So deadly was the animosity and so implacable the hatred that existed between these two nations of Jews, that, from the time of their severance to the destruction of their capital and the captivity of Israel, an almost perpetual state of warfare existed between Judah and Israel; and the term of Samaritan was one of the bitterest contempt and reproach that could be applied to any one. The antipathy borne by the people of Judah for those of Israel or Samaria was not only political, but religious. Theological dissensions were, however, in time greatly modified by the return of the Samaritans to the ancient form of worship, and by the erection of a temple in the capital, an event that was celebrated soon after the passage of Alexander the Great through the land of Syria. The city of Samaria, and capital of the kingdom, was situated on a hill, Mount Sameron, was founded by Omri, and from that time till its overthrow by the Assyrians was the residence of all the Kings of Israel. It was subsequently rebuilt by Herod, who called it Sebaste (a Greek word signifying Augustus), in honor of Augustus Cæsar.

SAMARITANS, a mixed people, which inhabited the region between Judea and Galilee, and formed a sect among the Jews. They consisted partly of the tribes of Ephraim and Manasseh left in Samaria by the King of Assyria when he had carried their brethren away captive, and partly of Assyrian colonists. On the return of the Jews from captivity they declined to mix with the Samaritans, though united with them in religion. The latter attempted to prevent the Jews from building the temple at Jerusalem, and failing in this, they built a temple on Mount Gerizim exclusively for their own worship. A few of the race still exist scattered in Egypt, at Damascus, and at Gaza. They adhere strictly to the Mosaic law, but are regarded by the Jews as heretics, as they accept only the Pentateuch, of which they have a special version of their own. They believe in the existence of angels, in a resurrection and future retribution, and expect the coming of a Messiah, in whom they look only for a prophet. In the synagogue the Aramaic Samaritan dialect is used, but they generally speak Arabic. They avoid any connections with other sects and marry only among their own nation.

SAMBRE, a river of France and Belgium; a tributary of the Meuse, which it enters at Namur; length 110 miles, great part of which is useful for navigation.

SAMNITES, a people of ancient Italy, that inhabited the country between Apulia on the E. and Latium and Campania on the W.; a brave and warlike nation, they distinguished themselves by their implacable hatred of the Romans, with whom from their earliest existence as a people they waged a perpetual hostility. They were, however, ultimately compelled to succumb before the growing power of Rome, and after a succession of disasters were finally exterminated about 290 B. C. Their capital city was called Samnium, or Samnis. The term Samnites was subsequently applied to an order of Roman gladiators, so named because accoutred and armed in the fashion of the ancient nation of Samnites.

SAMOAN ISLANDS, a group in the South Pacific Ocean, formerly known as the NAVIGATOR'S ISLANDS.

Location. — They are located about 2,000 miles S. and 300 miles W. of the Hawaiian Islands and 14° S. of the equator.

The group consists of 12 inhabited and 2 uninhabited islands, with an area of 1,700 square miles; aggregate population, (1917) 41,128. The islands are of volcanic origin, but fertile, producing cocoanuts, cotton, sugar, and coffee, the most important, however, being cocoanuts, from which the copra of commerce is obtained by drying the kernel of the cocoanut, the copra, which is exported to Europe and the United States, being used in the manufacture of cocoanut oil.

Government.—The government of the Samoan Islands had been from time immemorial under the two royal houses of Malietoa and Tupea, except on the island of Tutuila, which was governed by native chiefs. In 1873, at the suggestion of foreign residents, a house of nobles and a house of representatives were established, with Malietoa Laupepa, and the chief of the royal house of Tupea as joint kings. Subsequently Malietoa became sole king. In 1887 he was deposed by the German Government on the claim of unjust treatment of German subjects, who formed the bulk of the foreign population on the island, and was deported first to German New Guinea and then to the Cameruns, in Africa, and finally in 1888 to Hamburg, Tamasese, a native chief, being meantime proclaimed by the

Germans as king, though against the protest of the British and American consuls at Samoa. Mataafa, a near relative of Malietoa, made war upon Tamasese and succeeded to the kingship.

In 1889 a conference between the representatives of the American, British, and German governments was held at Berlin, at which a treaty was signed by the three powers guaranteeing the neutrality of the islands, in which the citizens of the three signatory powers would have equal rights of residence, trade, and personal protection. They agreed to recognize the independence of the Samoan Government and the free rights of the natives to elect their chief or king and choose a form of government according to their own laws and customs. A supreme court was established, consisting of one judge, styled the chief justice of Samoa.

Malietoa, who had been deported, was restored as king in November, 1889, and continued as such till his death, which occurred Aug. 22, 1898, when the consuls of the three powers, with the chief justice as president, took charge of the administration pending the election of a successor. Out of the election and recognition of this successor to King Malietoa, deceased, serious disagreements between the local representatives of the three governments maintaining the joint protectorate over the islands occurred. These were followed in 1899 by a new agreement between the three nations: the United States, Germany and Great Britain, whereby each nation assumed control over certain islands. Great Britain afterward ceded her share to Germany for concessions in Africa and elsewhere. In the first year of the World War (1914), German Samoa was captured by New Zealand troops and by the terms of the Peace Treaty of 1919 New Zealand was awarded control of this territory. A volcanic eruption, begun in 1905, in the interior of Savaii, continued until 1909, the greatest volcanic disturbance in the history of the world.

SAMOLUS, a genus of plants, order *Primulaceæ*. They are herbs with alternate leaves, and flowers corymbose or racemose. *S. valerandi*, the water pimpernel, found in wet, gravelly places throughout the world, is one foot high, and has small, white flowers, the corolla of which is twice the length of the calyx.

SAMOS, now **SAMO**, an island in the Grecian Archipelago, near the coast of Asia Minor; 45 miles S. W. of Smyrna, formerly belonging to Turkey, and now a possession of Greece; area, 180 square miles. It has a mountainous surface, partly covered with pine forests; several fertile and well-watered valleys; produces corn, fruit, and excellent wine; and has several valuable minerals, including argentiferous lead, iron, and marble. The principal town is Vathy, with a good harbor on the N. E. side of the island. The principal exports are raisins, skins, wine, and oil; imports, grain, colonial produce, and woven fabrics. Samos was inhabited in antiquity by Ionian Greeks, and had an important position among the Greek communities as early as the 7th century B. C. In the latter half of the 6th century it was in a specially flourishing condition under Polycrates, and subsequently was under the domination of Athens. In 84 B. C. it was united with the Roman province of Asia. In 1550 it was conquered by the Turks. It now occupies an exceptional position, having been erected into a tributary principality of the Sublime Porte in 1832, the ruler being a Greek prince. During the Balkan War of 1912 the Greeks seized the island. Pop. about 69,000.

SAMOSATA, the capital till A. D. 17 of the Syrian kingdom of Commagene, on the Euphrates, 130 miles N. N. E. of Aleppo. It was the birthplace of Lucian and of Paul of Samosata.

SAMOTHRACE, or **SAMOTHRAKI**, an island in the N. of the Ægean Sea, belonging to Turkey, about 14 miles long by 8 miles broad. It has a very mountainous surface, one of its summits exceeding 5,000 feet. Its chief products are corn and oil. The island is of interest as being in antiquity the principal seat of the worship of the CABIRI, and celebrated for its religious mysteries. It is interesting also as being visited by St. Paul in the course of his second missionary journey (Acts xvi. 11). Recent archæological researches have produced valuable results.

SAMOVAR, a Russian tea apparatus, the water in which is boiled by means of hot coals contained in an iron tube, and then poured over the tea.

SAMOYEDES, or **SAMOIEDES**, a people of Ural-Altaïc stock, inhabiting the shores of the Arctic Ocean, both in Europe and Asia, from the Yenisei to the White Sea. They consist of two main groups, a S. resembling the Tartars, and a N. and more degraded group. They are nomadic, and live chiefly by fishing, hunting, and keeping reindeer. They are of small stature, have a flat, round, and broad face, thick lips, wide nose, little beard, black hair in small quantity. Their religion is fetishism, though they have an idea of a great divinity; they are extremely superstitious, and generally peaceable. The reindeer supplies them

with food, clothing, tents, utensils, etc. They number about 17,000.

SAMP, an article of food consisting of maize, broken or bruised, which is cooked by boiling, and often eaten with milk; a dish borrowed from the aborigines of the United States.

SAMPHIRE, the *Crithmum maritimum*, an umbelliferous plant, very succulent, pale green, with bi-triternate leaves and lanceolate fleshy leaflets. It grows wild along the sea-coast of Europe, and where it abounds it is used by the inhabitants as a pickle, or an ingredient in salads, or as a potherb.

SAMPLER, a pattern or model of work; a specimen; particularly, a piece of needle-work sewed by learners, containing specimens of various kinds of stitches. Also one who apportions things into samples for inspection; as, a tea sampler.

SAMPSON, WILLIAM THOMAS, an American naval officer; born in Palmyra, N. Y., Feb. 9, 1840. He attended the public schools of his native town, and in 1857 entered the United States Naval Academy, from which he was graduated in 1861, and was assigned to duty on the frigate "Potomac." On July 16, 1862, he was promoted lieutenant and assigned to the practice ship "John Adams." In 1864 he was appointed executive officer of the ironclad "Patapsco," of the South Atlantic Blockading Squadron, and which was blown up in Charleston harbor Jan. 15, 1865, while he was on board. After serving on the frigate "Colorado," of the European squadron, he was promoted lieutenant-commander July 25, 1866; commander Aug. 9, 1874; and captain, March 26, 1889. Subsequently he was superintendent of the United States Naval Academy; a member of the International Prime Meridian and Time Conference; superintendent of the Torpedo Station; member of a board on fortifications and other defenses; chief of the Bureau of Naval Ordnance; superintendent of the Naval Observatory; a delegate from the United States to the International Maritime Conference in Washington; and president of the Board of Inquiry on the "Maine" disaster. On March 24, 1898, he was appointed commander of the North Atlantic squadron, succeeding Rear-Admiral Sicard, with the rank of rear-admiral. On June 1 he joined Commodore Winfield S. Schley, commander of the "Flying Squadron," off Santiago de Cuba, and took command of the combined squadrons, which included 16 warships. When it was known that the Spanish fleet under command of Admiral Cervera was blockaded in the harbor of Santiago, Admiral Sampson prepared a plan of operations for his fleet, to check any attempt at escape that Cervera might make. In assigning places for his different ships, he stationed the "New York," his own flagship, and the "Brooklyn," on which Commodore Schley was serving, on the two flanks, as these were the fastest ships in the fleet. When the Spanish vessels made their dash out of Santiago harbor,

ADMIRAL WILLIAM THOMAS SAMPSON

Admiral Sampson was absent from the fleet with the "New York," having gone to Siboney for a conference with General Shafter. The "New York" turned back and rejoined the fleet, arriving just in time to participate in the last engagement, which had thus been fought by Commodore Schley as second in command. Admiral Sampson was promoted rear-admiral on Aug. 12, 1898; appointed commander of the Boston navy yard on Oct. 14, 1899; and was relieved of this command, owing to ill health, Oct. 1, 1901. On Feb. 9, 1902, Admiral Sampson was retired, and he died the same year.

SAMSON, in Scripture, the son of Manoah, of the tribe of Dan. He was endowed with extraordinary strength and

obtained several advantages over the Philistines. At length his mistress betrayed him into the hands of his enemies, who put out his eyes, and made him work at a mill. On a public festival when the Philistine lords were assembled in the temple of Dagon, Samson was sent for to show them sport. Laying hold of two pillars of the temple as if to support himself, he pulled down the building and was buried in the ruins, with more than 3,000 Philistines.

SAMUEL, in Scripture, a prophet and judge of Israel, of the tribe of Levi, was called in his youth, while attending Eli, the high priest. He consecrated Saul King of Israel and was afterward commanded to anoint David. After governing Israel either alone or in conjunction with Saul during 50 years, he died in the 90th year of his age, 1072 B. C.

Books of Samuel, two of the historical books of the Old Testament, called after the prophet Samuel, their reputed author. They were anciently reckoned as one book by the Jews, the present division into two being derived from the Septuagint and Vulgate. Various attempts have been made to determine the age and authorship of these books. The common opinion, founded on I Chron. xxix. 29, is that the first 24 chapters were written by Samuel himself, and the remainder by Nathan and Gad. There is no reason to believe, however, that these documents were identical with the present Books of Samuel. From Samuel and Kings being sometimes called the four Books of Kings, John is of opinion that they were all written by the same person, and at a date so recent as the 30th year of the Babylonish captivity. This hypothesis, however, will not stand the test of criticism. The language and style of the books are very different, denoting different periods and different authors. The Books of Samuel bear the impress of a hoary age in their language, allusions, and mode of composition. With respect to the person who compiled and brought them together in their present form, all that can be affirmed with probability is that he lived not long after the time of David.

SAMUEL, RT. HON. HERBERT LOUIS, a British statesman; born in Liverpool in 1870. He was educated at University College School and at Balliol College, Oxford, graduating with first-class honors in 1893. In 1895 he contested South Oxfordshire as a liberal for a seat in the House of Commons and also in 1900. He was elected to represent the Cleveland Division, N. Riding, Yorkshire, in 1902, and held the seat till 1918. In 1905-9 he was Parliamentary Under-Secretary of the Home Department, and Chancellor of the Duchy of Lancaster, with a seat in the cabinet in 1909-10 and 1915-16. He was Postmaster-General, 1910-14 and 1915-16; President of the Local Government Board, 1914-15; Secretary of State for Home Affairs, 1916; Chairman of the Select Committee on National Expenditure, 1917-18; British

RT. HON. HERBERT LOUIS SAMUEL

Special Commissioner to Belgium in 1919. In 1920 he was appointed British High Commissioner under the mandate over Palestine given to Great Britain by the Supreme Council of the Allied Powers at San Remo on April 25, 1920, with the object of establishing a National Home for the Jewish people. His published works include: "Liberalism, Its Principles and Proposals"; "The War and Liberty"; and numerous political pamphlets and articles.

SAMURAI, a Japanese chivalric order of the feudal period; translated to its nearest English equivalent it signifies "guard." The Samurai were a military class or caste, prominent in early times in Japan and were termed individually or collectively, Samurai, with equal propriety. Originally, the name Samurai applied only to those soldiers who acted as personal guards to the Mikado and occupied quarters in the Imperial Palace. In its final usage it became a descriptive term for the entire military caste of the

Imperial Order, and included in its hierarchical significance: the commander-in-chief, or "shogun"; the landed nobility owing fealty to the Emperor and holding land under military tenure, or the "daimyos"; and the "samurai," the military retainers of the feudal class, the privileged two-sword men, the fighting men, the caste of gentlemen, and the scholars of the nation. When, in 1868, the "shogunate" was abolished, followed in 1871 by the restoration of all feudal lands to the Emperor by the "daimyos," the "samurai" ceased to have any existence beyond a tradition in the national life of Japan. In 1878 the name "samurai" was abandoned and its significance has been largely lost in modern Japanese life except in so far as it has survived as an inspirational code of chivalric conduct and bravery.

SAMYDACEÆ, a small order of plants, alliance Violales, consisting of trees and shrubs exclusively tropical and principally South American. Leaves alternate simple, evergreen, stipulate, usually with round or linear transparent markings. Flowers perfect, calyx inferior, 4-5 partite. Stamens perigynous, two, three, or four times as many as the segments of the calyx. Fruit superior, capsular, leathery, one-celled. Seeds numerous, arillate, with oily or fleshy albumen and large embryo. The plants are of little economic value.

SANAA, the former capital of the Imáms of Yemen; 200 miles N. by W. of Aden, in a broad grassy valley, sheltered by hills 1,200 and 1,500 feet high; is itself 7,250 feet above the sea. The city and its suburbs are surrounded by walls, and overlooked by a couple of ruined fortresses. Few of the buildings are older than the 16th century, though the city has been in existence from the remotest ages. It was long the capital of the independent Imáms of Yemen, and during that period was noted for its handsome buildings and gardens, its palaces, mosques, baths, etc. In 1872 it submitted to Turkish rule and has since then declined in commercial importance and been allowed to fall into decay. Pop. about 25,000.

SAN ANGELO, a city of Texas in Tom Green co. It is on the Concho river, and on the Gulf, Colorado, and Sante Fé and the Kansas City, Mexico, and Orient railroads. The city is an important shipping center for cattle and is the center of an extensive farming region. The chief industries are connected with cattle raising and agriculture. Pop. (1910) 10,321; (1920) 10,050.

SAN ANTONIO, a city and county-seat of Bexar co., Tex.; on the San Pedro and San Antonio rivers, and on the Southern Pacific, the International and Great Northern, the San Antonio and Gulf Shore, and the San Antonio and Aransas Pass, and other railroads; 80 miles S. W. of Austin. Here are the headquarters of the United States Military Department of Texas, a United States Military Reservation covering 200 acres, St. Louis College (R. C.), St. Mary's College (R. C.), San Antonio Academy, Ursuline Academy, West Texas Military Academy, a collegiate institute, high school, street railroad and electric light plants, court house, United States Government building, a number of National and State banks, and daily, weekly, and monthly periodicals. In many lines, especially in manufacturing, San Antonio is the distributing point for the entire State. San Antonio has 34 beautiful parks and plazas scattered about the city, comprising 423 acres and valued at more than $2,000,000. Notable among these is Brackenridge Park with an area of about 200 acres, fifteen minutes from the center of the city; and San Pedro with an area of about 40 acres, ten minutes from the center of the city. San Antonio is the seat of Protestant Episcopal and Roman Catholic bishops. There were in 1919, 37 public and 25 private schools, with 24,491 enrolled in the public schools. It has an extensive trade in peanuts, livestock, hides, lumber, cotton, and wool, and manufactories of flour, ice, cars, brick and tile, shoes, etc., and an assessed property valuation of over $388,000,000. San Antonio had in 1919, 28 banks—National, State and private. Their combined capital was more than $8,000,000; their deposits average about $50,000,000 and their loans over $36,000,000. In 1714 the Spanish constructed Fort San Fernando on the right bank of the San Pedro, and four years later the Alamo mission was founded, but afterward both were removed to the site of San Antonio. During the Spanish and Mexican régimes San Antonio was the capital of Texas. In 1836 the massacre of the Alamo occurred here, and in 1861 the Union forces under General Twiggs were forced to capitulate. In 1873 San Antonio received a city charter. Pop. (1910) 96,614; (1920) 161,379.

SAN ANTONIO, the name of several capes: (1) A cape at the S. entrance to the Rio de la Plata, in the Argentine Republic. (2) a cape in Spain, on the E. coast, in the province of Alicante, and extending into the Mediterranean Sea. (3) A headland in Brazil, at the entrance to the Bay of Bahia, and on which is a

lighthouse at the altitude of 140 feet above the sea. (4) The N. E. rocky peak, or pointed headland, in the island of Koonasheer, one of the Kooril group. (5) The W. point of Cuba.

SAN ANTONIO, a river in Texas, formed by the union of Leon creek and Medina river, in Bexar co. Its course is east and through Wilson, Karnes, and Goliad counties. It flows into the Espiritu Santo Bay, an indenture of the Gulf of Mexico, and is nearly 200 miles long.

SANATORIUM, a place to which people resort for the improvement of their health.

SANBENITO, a coat of sackcloth worn by penitents on their reconciliation to the church. Also a loose cloak or upper garment worn by persons condemned to death by the Inquisition on their way to the *auto da fé*. They were painted over with flames, figures of devils, the person's own portrait, etc.; or in the case of those who expressed repentance for their errors, with flames directed downward. Those worn by Jews, renegades, and sorcerers bore a St. Andrew's cross in red on back and front.

SAN BERNARDINO, a mountain peak in California; the highest point of the Coast Range; elevation 11,600 feet.

SAN BERNARDINO, a city and county-seat of San Bernardino co., Cal.; on the Southern Pacific, the Salt Lake Route, the Atchison, Topeka and Santa Fé and the Pacific Electric railroads; 60 miles E. of Los Angeles. It is the center of the great San Bernardino basin and is surrounded by a rich mining, agricultural, and fruit-growing region. Within view of the city is Mount San Bernardino, the highest peak of the Coast Range. Here are a court house, public library, Y. M. C. A. building, the Hall of Records, a high school, churches and hotels, several National and State banks, and daily and weekly newspapers. Pop. (1910) 12,779; (1920) 18,721.

SANBORN, FRANKLIN BENJAMIN, an American journalist; born in Hampton Falls, N. H., Dec. 15, 1831; was graduated at Harvard University in 1855 and early turned his attention to journalism. He was editor of the Boston "Commonwealth," the Springfield "Republican" and the "Journal of Social Science" in 1867-1897; published 20 State reports on charities, labor, etc.; lectured extensively at Cornell, Smith, and Wellesley Colleges, and at the Concord School of Philosophy; and was intimately associated with various State and private charitable organizations. His publications include biographies of Emerson, Thoreau, Alcott, John Brown and Dr. Earle, and numerous social and philosophical papers and lectures. He died in 1917.

SAN CARLOS, a town in the Philippine Islands, province of Pangasinan, on the Island of Luzon. It is situated on the Agno River, about 10 miles southeast of the Lingayen Gulf, near the Daugaupan-Manila railway. Pop. about 28,000.

SAN CRISTÓBAL, (1) Capital of the State of Chiapas, Mexico; has a handsome capitol, a cathedral, and a secondary school. (2) A town of Venezuela, in the State of Los Andes, with streets straight, but much cut up by small ravines; an important trade (especially in coffee), mainly in the hands of Germans and Danes; deposits of coal beside the town, and nearby copper mines and petroleum wells.

SANCTIFICATION, a term applied in Scripture, as well as in theology, to denote the process by which the effaced image of God in man is restored, and the sinner becomes a saint. It is based on the holiness of God, who communicates His purity to His people by means of the Holy Spirit. Sanctification is distinguished from justification in this, that while justification changes the state of the sinner in law before God as a judge, sanctification changes the heart before Him as a father. Justification precedes sanctification; the one removing the guilt, the other the power of sin. The former is an act done at once, the latter is a gradual process.

SANCTUARY, among the ancient Jews the innermost chamber of the tabernacle—afterward of the temple, in which was kept the ark of the Covenant, and was never entered, except by the high priest once a year. It was also called the Holy of Holies, *Sanctum Sanctorum*. In the Christian Church, the bema, or inner portion of the church, immediately round the altar, was called the sanctuary. From the sacred character of the churches, and from the rising power of the clergy, they came to be resorted to as asylums by fugitives from the hands of justice, and afterward certain churches were set apart specially for that purpose, and were termed "sanctuaries." The abuses to which this system gave rise, as tending entirely to defeat the ends of justice, led to its abolition in all the Christian countries.

SAND, comminuted fragments of igneous, metamorphic, or volcanic rocks, or of chert, flint, etc. They are detached from the parent rock, and as bowlders

and pebbles are ground against each other by water on sea-beaches or in any similar way. The colors of sand correspond to those of the minerals in the rocks from which they were detached. It may be red, white, gray, or black, but when quartzose, as it often is, it is normally reddish-yellow, from oxide of iron. Sea-sand often contains Foraminifera, spicules of sponges, minute fragments of shells, portions of the body of Echinoderms. (See SANDSTONE.) In the plural, tracts of land consisting of sand, as the deserts of Arabia or Africa; also, tracts of sand left exposed by the ebb of the tide.

SAND, GEORGE, best known name of MADAME ARMANTINE LUCILE AURORE DUPIN DUDEVANT, one of the greatest of French novelists; born in Paris, July 5, 1804. She was the daughter of Maurice Dupin, an officer of the republican army, who was descended from a natural daughter of Marshal Saxe. Till the age of 14 she was brought up at the Château of Nohant, near La Châtre (department of Indre), mostly under the care of her grandmother, afterward spending nearly three years in an Augustinian convent in Paris. In 1822 she married Baron Dudevant, to whom she bore a son and a daughter; but in 1831 separated from him, and took up her residence in Paris. In conjunction with Jules Sandeau, a young lawyer, she wrote "Rose and White," which was published in 1831, with the pseudonym Jules Sand The reception it met with afforded her an opportunity of publishing a novel solely by herself—"Indiana," under the name of George Sand, which she ever after retained. "Indiana" had a brilliant success, but excited much criticism by its extreme views on social questions. This was also the case with many others of her works. "Valentine," "Lélia," "Jacques," "André," "Leone Leoni," "Simon," "Mauprat," "The Last Aldine," "Lavinia," "Metalla," and others, appeared within the first few years after her début. She visited Italy with Alfred de Musset; and lived eight years with Frédéric François Chopin, the composer. These relations also influenced or occasioned some of her works (as "She and He," 1859). In 1836 she obtained a judicial separation from her husband, with the care of her children. She took an active interest in the Revolution of 1848, and contributed considerably to newspaper and other political literature. In 1854 she published "Story of My Life," a psychological autobiography. Among her later novels are: "The Man of Snow," "Sylvestre," "The Devil's Pool," "François Champi," "Little Fadette," "Jean," "Teverino," "The God-daughter," "The Master Bellringers." Her published works consist of upward of 60 separate novels, a large number of plays, and numerous articles in literary journals. She died in Nohant, June 8, 1876.

SANDAL, a protection for the foot, worn in ancient times, and which, in the Authorized Version of the Old Testament, is usually denoted by the word translated shoe. It was usually a sole of hide, leather, or wood, bound on the foot by thongs; but it may sometimes denote such shoes and buskins as eventually came into use. In transferring a possession or domain, it was customary among the

SANDALS

Jews to deliver a sandal (Ruth iv. 7), as in our Middle Ages, a glove. Hence, the action of throwing down a shoe on a region or territory was a symbol of occupancy (Ps. lx. 8). It was undoubtedly the custom to take off the sandals on holy ground, in the act of worship, and in the presence of a superior. Hence the command to take the sandals from the feet under such circumstances (Exod. iii. 5; Josh. v. 15). This is still the well-known custom of the East—an Oriental taking off his shoe in cases in which a European would remove his hat.

SANDAL WOOD, the wood of *Santalum album*, a small, greatly branched, evergreen tree, with leaves opposite and entire, which have been compared to those of the myrtle, as the inflorescence, an axillary and terminal thyrsus, has been to that of the privet. The flowers are at first yellowish, but afterward of a deep ferruginous hue. Though they are inodorous, the wood when cut, especially near the root, is highly fragrant. It grows in the dry region of southern India, and in the islands of the Indian Archipelago. It is largely exported from India to China and Arabia, and, to a certain extent, to Europe. The heart wood is used in the East for carving, for incense, and for perfume. The seeds

yield by expression a thick viscid oil, burnt by the poorer classes in India. An essential oil is also distilled from the wood. Hindu doctors consider sandal wood sedative and cooling, and use it in gonorrhœa. The sandal wood of the Sandwich Islands is derived from *S. freycinetianum* and *S. paniculatum*. Red sandal wood is the wood of *Pterocarpus santalinus*, growing in Coromandel and Ceylon. In occidental pharmacy it is used only to color the compound tincture of lavender. In India the name is also given to *Adenanthera pavonina*.

SANDALWOOD ISLAND, or **SUMBA**, an island in the Malay Archipelago, belonging to the group called Sunda Islands, owned by Holland, and situated 40 miles S. of Flores. Area, 4,510 square miles. It is composed of a plateau 3,000 feet above the sea level with precipitous coasts. The name is derived from the valuable sandalwood which, with ebony, makes up a large part of the thick forests. Pop. about 250,000.

SANDARAC, or **SANDARACH RESIN**, a friable, dry, almost transparent, tasteless, yellowish white resin, which is imported from Mogador, Morocco. It is completely soluble in oil of turpentine, but not completely soluble in alcohol. When heated, or sprinkled on burning coals, it emits an agreeable balsamic smell. It exudes from the bark of the sandarac tree (*Callitris quadrivalvis*), a native of the N. of Africa, of the natural order *Coniferæ*. It is employed in making varnish, and generally speaking for the same purposes as mastic. The Australian species also exude sandarac. The finely powdered resin is rubbed, as pounce, on the erasures of writing paper, after which they may be written on again without the ink spreading. The mottled butt wood of the sandarac is highly balsamic and odoriferous, extremely durable and valuable for cabinet makers.

SANDAY, one of the Orkneys, an island of very irregular shape, generally with a very flat surface and a light sandy soil; greatest length, 13 miles. There are a number of small lakes. There is another small island of the same name in the Inner Hebrides, connected with Canna at low water, 4 miles N. W. of Rum.

SANDAY, WILLIAM, an English theologian and scholar, born at Holme Pierrepont, Nottingham, in 1843. He received his education at Balliol and Corpus Christi Colleges, Oxford. For several years he was the principal of Hatfield's Hall, Durham, and until 1895 was a fellow of Exeter College, Oxford. From that date he was Lady Margaret professor of divinity and canon of Christ Church. He was appointed chaplain to the King in 1903. His published writings include "The Gospels in the Second Century" (1876); "The Life of Christ in Recent Research" (1907); "The Primitive Church and Reunion" (1913); "The "Deeper Causes of the War" (1914); and "Meaning of the War for Germany and Great Britain" (1915).

SAND BLAST, one of the most wonderful uses of sand, by means of which glass, stone, metals, or any other hard substance may be cut or engraved. If a stream of sharp sand be let fall from a high box (as high as the ceiling of a room) through a tube on to a plate of glass held under it, the sand will cut away little grains of the glass till at length the whole surface will be cut or scratched and it will look like ground glass. If, instead of cutting the glass all over, it is wanted to engrave a pattern or figure on it, the workman has only to cover the parts of the glass which he does not want cut with a stencil plate made of leather, rubber, paper, wax, etc., for the sand will not cut any soft substance. By this means only the uncovered parts are cut, and when the stencil is taken off the pattern will be seen. General Tilghman of Philadelphia, who first found out how to do this, made a machine in which the sand is blown on to the things to be cut by a blast of air or steam. Glass signs, glass globes for lamps and gas burners, tumblers, goblets, and other glassware may be engraved in this way very fast, and with the most beautiful designs. Metals and stones also may be cut by means of the sand blast, which will not only scratch the surface, but will cut it away to any depth. The marble tombstones put up in the National cemeteries to the memory of soldiers killed in the war were made in this way.

SANDBURG, CARL, an American writer and poet, born in Galesburg, Ill., in 1878. He studied at Lombard College from 1898 to 1902. From 1910 to 1912 he acted as secretary to the mayor of Milwaukee, Wis., and from the latter date was engaged in newspaper and editorial work. In 1914 he was awarded the prize given by the Poetry Magazine. During the Spanish-American War he served as a private. His volumes of poetry include "Chicago Poems" (1915); and "Corn Huskers" (1918). He is regarded as one of the most talented of the younger school of American poets.

SAND CRAB, or **RACING CRAB**, a genus (*Ocypoda*) of crabs which live in holes in the sand along the sea shores of warm countries. *O. cursor* inhabits the Mediterranean, Red Sea, and Indian

Ocean, and is remarkable for the rapidity of its motions.

SAND EEL, in ichthyology, a popular name for the genus *Ammodytes*, and especially for *A. lanceolatus*, called also the greater, to distinguish it from *A. tobianus*, the lesser sand eel. They live in shoals, and are much sought after by fishermen, who discover their presence on the surface by watching the porpoises which feed on them.

SANDEMANIANS, in Church history, the followers of Robert Sandeman, who in the latter part of the 18th century introduced into England and America the doctrine of the GLASSITES (*q. v.*). The body is not numerous. They have a weekly communion, and dine together every Lord's day, admit new members with a kiss of charity, abstain from blood, wash each other's feet, and each member is bound, to the full extent of his income, to support his Church and the poor.

SANDERLING, in ornithology, *Calidris arenaria*, described by Saunders as "a Tringa without a hind toe," a winter visitant, arriving about the beginning of August and leaving about April. The adult male is about eight inches long, female slightly larger. The summer plumage is somber on the upper surface, edged with red, the whole becoming light ash gray in winter; under surface pure white.

SANDERS, LIMAN VON (LIMAN PASHA), a German general, sent to Turkey in 1913 as the head of a mission to reorganize the Turkish Army on a modern Prussian basis, the Turks having just been badly beaten by the Bulgarians, Greeks and Serbians in the Balkan War. In his task, General Von Sanders was assisted by General Von der Goltz. In May, 1914, Von Sanders issued sealed orders for the mobilization of the Turkish reserves and had them distributed among the mayors of all communities throughout the empire. According to instructions these orders were opened on Aug. 3, 1914, with the result that the Turkish Army automatically put itself on a war footing regardless of the situation in Constantinople. Von Sanders had command of the defense of the Dardanelles, and during the heavy fighting established his headquarters in Gallipoli. In August, 1915, he took command of the Turkish armies on the Caucasus front. When the war was ended he was arrested by the Allies in Constantinople, but early in 1919 was allowed to return to Germany.

SANDERSON, JULIA, an American singer and actress, born in Springfield, Mass., in 1887. She was educated in the public schools and made her first appearance with the Forepaugh Stock Company in Philadelphia. She afterward played as star in many operas and plays.

SAND FLIES (genus *Simulium*), the name of certain flies found in various countries, the bite of which may give rise to painful swellings. They are included in the family *Tipulidæ*, which also includes the well-known "daddy long legs," or crane flies.

SAND GROUSE, in ornithology, the family *Pteroclidæ*, called also rock pigeons. Elegantly formed birds, with pointed tails, and plumage of beautifully varied protective tints. They are preeminently desert birds, and are found in great numbers in the most arid situations and on the most open and barren plains. Their food consists of hard seed and insects. *Pterocles setarius* is the pin-tailed sand grouse, and *Syrrhaptes paradoxus* Pallas's sand grouse.

SAND HOPPER, in zoölogy: (1), the genus *Talitrus*, and especially *T. locusta;* (2) The genus *Gammarus*.

SAN DIEGO, a city, port of entry, and county-seat of San Diego co., Cal.; on San Diego Bay, and on the Atchison, Topeka and Santa Fé, the Los Angeles and San Diego Beach, the San Diego and Arizona, and the San Diego and Southwestern railroads; 120 miles S. E. of Los Angeles. Next to San Francisco, its harbor is considered the finest on the Pacific coast. No milder or more uniform climate is to be found, and this has made the city one of the most popular health resorts in the United States. Here are a United States custom house, public library, Academy of Our Lady of Peace (R. C.), street railroad and electric light plants, National, State, and private banks, and several daily, weekly, and monthly periodicals. The Army and Navy Departments have large tracts on the bay frontage for coaling stations and fortifications. The city has machine shops, foundry, furniture factories, fertilizer works, salt works, carriage and wagon factories, flour and planing mills, etc. The first Mission in California was founded here in 1769, and the city was laid out in 1867. The monument on the Mexican boundary, La Jolla cave, Sweetwater dam, and the San Diego Mission are objects of interest. Pop. (1910) 39,578; (1920) 74,683.

SAND LIZARD, in zoölogy, the *Lacerta agilis*, about seven inches long, of which the tail is four; palatal teeth. Usual color sandy-brown, with obscure longitudinal bands of a darker due, line of round black spots on side. The female

lays 12 to 14 eggs in the sand, covers them, and leaves them to be hatched by solar heat. Common in northern and central Europe.

SAND MARTIN, in ornithology, the *Hirundo riparia*, called also the bank martin and bank swallow; length about six inches; upper parts and a broad band across the breast grayish brown, lower parts brownish white. It makes its nest in the steep banks of rivers, sand pits, quarries, and sea banks, and deposits four or five white eggs. It breeds in N. latitudes, but goes S. in autumn, returning again in spring.

SAND MOLE, in zoölogy, the *Bathyergus maritimus*, a rodent from the Cape of Good Hope. It is about the size of a wild rabbit, with light grayish-brown fur, rather variable in tint in different individuals. The eyes are very small; external ears wanting; tail short.

SANDPAPER, an abrading agent made by coating paper or thin cotton cloth with glue and dusting fine sand over it with a sieve. Sandpaper is intermediate between glass paper and emery paper in its action on metals, but is less energetic than glass paper in its action on wood.

SANDPIPER, in ornithology, a popular name for several wading birds. Yarrell enumerates the following: The buff

SANDPIPER

breasted sandpiper (*Tringa rufescens*), Bartram's sandpiper (*Bartramia longicauda*, formerly *Totanus bartramii*), the common sandpiper or summer snipe (*Totanus hypoleucus*), the spotted sandpiper (*Totanus macularis*), the green sandpiper (*Totanus ochropus*), and the wood sandpiper (*Totanus glareola*). In ichthyology, the *Petromyzon branchialis*, the larva of which has been long known under the name of Ammocœtes.

SAND PIPE, or **SAND GALL**, in geology (plural), deep cylindrical hollows in a vertical direction found in England, France, and elsewhere, penetrating the white chalk and filled with sand and gravel. One seen by Sir Charles Lyell at Norwich in 1839 was 12 feet in diameter, and more than 60 feet deep. Mr. Trimmer attributed them to the action of the sea on a beach or shoal; Lyell to the chemical action of water charged with carbonic acid, derived from the vegetable soil and the roots of trees, on the chalk below.

SANDRINGHAM, a Norfolk estate, 3 miles from the sea and 7½ miles N. N. E. of Lynn, England, comprising over 7,000 acres; was purchased in 1862 by the Prince of Wales, later Edward VII. The then existing mansion was demolished, and the present hall built in 1869-1871, a red-brick Elizabethan country house, standing in a pleasant park of 200 acres; special features are the iron "Norwich gates," the dairy, and the splendid cottages. A fire on Nov. 1, 1891, did damage to the amount of over $50,000. The Germans made an aerial attack on the place in 1915.

SANDSTONE, any stone which is an agglutination of grains of sand, whether calcareous, siliceous, or of any other mineral nature. Siliceous sandstones are the most common. They vary in compactness from scarcely cemented sand to a hardness approaching that of quartz rock. When very fine in grain, they are called freestones; when coarse and composed of angular or subangular grains of sand, they become grits; when pebbly, pudding stones. Sandstones occur in nearly every geological formation from the Cambrian to the Tertiary. Many furnish building and paving stones.

SANDUSKY, a city and county-seat of Erie co., Ohio; at the mouth of the Sandusky river, on Sandusky Bay, an arm of Lake Erie, and on the Lake Shore and Michigan Southern, the Baltimore and Ohio, and other railroads; 56 miles W. of Cleveland. It contains a high school building, court house, the State fish hatchery, a public library, waterworks, street railroads, electric lights, National and other banks, and daily and weekly newspapers. It has a large export trade in fresh and salted fish, lumber, limestone, coal, iron ore, apples, grapes, and wine. The city is one of the largest fresh fish markets

in the world, and is in the heart of a great grape-growing region. Its manufactured articles include carpenters' tools, handles, chemicals, dynamos, glass, aeroplane engines, cement, spokes and hubs, threshing machines, boilers, etc. Pop. (1910) 19,989; (1920) 22,897.

SANDUSKY BAY, a bay in Ohio, projects from Lake Erie between Erie and Ottawa counties; constitutes a fine harbor, in which vessels find safety during storms. On its shore, near the mouth of the Sandusky river, is the city of Sandusky. Its shore in places is made attractive by strips of forest. It is 20 miles long and 5 miles wide.

SANDUSKY RIVER, a river in Ohio, whose source is near the W. border of Richland co. Its course is W. through Crawford co. till it reaches Upper Sandusky, where it turns N. and traverses the counties of Seneca and Sandusky, and flows into the W. end of Sandusky Bay, at Sandusky. It is 150 miles long.

SAND WASP, the common name of a family of fossorial hymenopterous insects, the *Sphegidæ* of Latreille. There are numerous species, generally large, violet blue, sometimes banded with yellow; the females have a sting; there are no neuters, the female making her own nest in the sand.

SANDWICH (so called after John Montagu, 4th Earl of Sandwich, Kent, England, who used to have sandwiches brought to him at the gaming table, to enable him to play without leaving off), two thin slices of bread, plain or buttered, with a slice of meat, as ham, beef, etc., seasoned with mustard, between them; hence, applied to anything resembling a sandwich, *i. e.*, consisting of a person or thing placed between two different things.

SANDWICH TERN, in ornithology, the *Sterna cantiaca*, first observed in England at Sandwich (whence its popular name), in 1784, by Boys. It is a summer visitant, leaving in August. Wings and back pearl-gray, breast white, head above the eyes black. Length about 15 inches.

SANDY HOOK, a low beach at the mouth of New York harbor, about 5 miles long, and varying in width from a few hundred feet to ¾ of a mile. There is a beacon light at the very extreme point, but the Sandy Hook lighthouse is ¾ of a mile to the S. The National Government established Fort Hancock and heavy ordnance proving grounds here.

SANDYS, EDWIN, an English clergyman; born in Hawkshead, England, in 1528, and was educated at Cambridge University, where he became master of Catherine Hall and subsequently vice-chancellor of the university. Being a partisan of Lady Jane Grey, he was imprisoned in the Tower; but was liberated at the end of four months, and crossed to Germany. On the accession of Elizabeth he returned to England, and was made Bishop of Worcester in 1559. In 1570 he was translated to London, and thence to York in 1577. He died in Southwell, July 10, 1588. His son, SIR EDWIN SANDYS (born in Worcester, England, in 1561), was employed by James I. on several missions, received the honor of knighthood, was connected with the Second Virginia Company and otherwise with American colonies, and published "Europæ Speculum, a Survey of the State of Religion in the Western Parts of the World." He died in Northborne, Kent, in October, 1629. Another son, GEORGE SANDYS (born in Bishopsthorp, England, in 1578), published a "Relation of Travels in the East," a metrical translation of Ovid's "Metamorphoses," metrical paraphrases of the Psalms, Job, Ecclesiastes, Song of Solomon, etc. His poetry is praised by Dryden and Pope. He died in Bixley Abbey in March, 1644.

SAN FERNANDO, a town in the Philippine Islands, on the Island of Cebu, 5 miles southwest of the capital town, on the east coast of the island. Pop. about 19,000.

SAN FERNANDO, a town in the Philippine Islands, on the island of Luzon, in Pampango province. It is a small town, about 4 miles N. E. of Bacolor, with a telegraph and railroad station on the Manila-Daugaupan railroad. It is of considerable importance on account of the sugar mills located in the vicinity and large amounts of sugar are shipped to Manila.

SAN FERNANDO, a town in the Philippine Islands, on the W. coast of the Island of Luzon, in the province of La Union, near the entrance to the Gulf of Lingayen. It has a good port, and considerable amounts of sugar, indigo, hemp and rice are shipped to Manila by sea. Pop. about 19,000.

SANFOIN (*Hedysarum onobrychis*), a perennial forage plant; native of Europe up to lat. 51°; a legume which has the property of binding light, dry, sandy, and chalky soils by its roots. English and Continental writers agree as to its nutritious qualities for stock, and also to its value as a crop to shade the soil and for plowing under. It has been tried from time to time in the United States, both N. and S., but has not met with favor. See SAINFOIN.

SANFORD, a city of Florida in Seminole co. It is on St. John's river, and on the Atlantic Coast Line railroad and is the center of an important truck farming and fruit growing region. Pop. (1910) 3,570; (1920) 5,588.

SANFORD, a town of Maine, in York co. It is on the Boston and Maine railroad and is an important industrial center having manufactures of shoes, blankets, yarn, lumber products, etc. It is the seat of the Nasson School for young women. Pop. (1910) 9,049; (1920) 10,691.

SANFORD, EDMUND CLARK, an American educator, born in Oakland, Cal., in 1859. He graduated from the University of California in 1883 and took post graduate studies at Johns Hopkins University. From 1883 to 1885 he was on the faculty of Oahu College, Honolulu. Following a year as instructor of psychology at Johns Hopkins, he became, in 1889, assistant instructor of psychology at Clark University. He was successively assistant professor and professor of experimental and comparative psychology. In 1909 he was appointed president of Clark College. He was a member of several learned societies. He wrote "A Course in Experimental Psychology" (1898); and many papers on psychological subjects.

SAN FRANCISCO, a city of California, on San Francisco Bay and on many railroad lines. It is the western terminal for three trans-continental systems and three coast trunk lines, the Southern Pacific, the Atchison, Topeka and Santa Fé, and the Western Pacific. Its advantageous situation has made it the chief seaport on the W. coast of North America. It occupies the mountainous peninsula bordering upon the Pacific on the W., the Golden Gate on the N., and the Bay of San Francisco on the E. Since the completion of the Panama Canal its importance as an ocean terminus has rapidly increased. The city has a land area of about 50 square miles. It is unusually hilly and the hills cut in two directions, rising steeply from sea-level to several hundred feet above the sea. Southwest of the main portion of the city the twin peaks, Mt. Sutro and Mt. Davidson rise to a height of over 900 feet above water-level. Among the best known hills are Telegraph Hill, Nob Hill, and Russian Hill. Nob Hill was the site of the palatial residences of the early millionaires who made their fortunes in the gold mines of the State.

A large part of the site of the city is reclaimed area, won from the bay. The streets of the city are for the most part broad and well paved. South of Market Street the streets are practically level. North of the street, however, the streets run with a steep grade. Market Street is the chief thoroughfare, on which are located the leading banks, department stores, newspaper offices, and office buildings. The junction of Market, Kearny and Geary streets is the business center of the city. Market Street and the adjacent streets form the retail shopping district.

The climate of San Francisco is invigorating. The winters are warm while the summers are cool. The mean temperature ranges from 50.8° to 56.5°. The rainfall averages about 21 inches. Snow rarely falls in the city, while it is entirely free from cyclones and tornadoes. There are within the city limits many beautiful parks and boulevards. Golden Gate Park has an area of over 1,000 acres and was reclaimed from the sand dunes. It contains playgrounds, zoölogical gardens, an academy of sciences, a museum, and many other attractions. There are in all 35 public parks and squares, embracing about 1,400 acres. The Presidio, the military reservation of the Federal Government, is practically a part of the park system of the city. The Marina, which was the site of the Panama-Pacific International Exposition contains the Palace of Fine Arts, the Column of Progress, and the beautiful Marina Boulevard, which skirts the Golden Gate. Since the fire of 1906 the city has devoted much attention to the system of roads and boulevards. The historic Mission Road, the city's oldest thoroughfare, has been modernized and forms a most attractive boulevard.

The city is notable for its magnificent private and public buildings. During the last decade the business district has been completely rebuilt at an expenditure of approximately $350,000,000. For many blocks along Market Street and its tributary thoroughfares imposing structures stretch in unbroken ranks. One of the most extensive examples of city planning in the United States is the Civic Center, situated north of Market Street and east of Van Ness Avenue. This includes the city hall, erected at a cost of $4,000,000 and the Auditorium, with a seating capacity of 12,000, and a public library. These buildings are grouped about a spacious plaza. Nearly all denominations have handsome church edifices. Notable among these are Old St. Mary's, St. Luke's, the First Congregational, the First Presbyterian, and St. Mary's Cathedral.

The city has excellent educational facilities. In 1919 there were 66,893 pupils enrolled in the public schools. The University of California is 9 miles E. of the

city, and Leland Stanford, Jr., University is 30 miles S. In the city proper are the College of Physicians and Surgeans, St. Ignatius College, San Francisco Institute of Art, and many private educational institutions. The technical schools include the California School of Mechanical Arts, the Polytechnic High School, and the Y. M. C. A. Technical School.

San Francisco has in recent years become one of the most important industrial and commercial cities in the United States. Its harbor is unsurpassed and has an area of 420 square miles with a water frontage on the bay of 10 miles. In 1918 there was a completed sea-wall, 15,000 feet in length, with 39 piers and many open wharves. New docks and wharves are being built by the State. Hunters Point Dock is the largest dry dock on the Pacific coast. There are direct steamboat connections to all ports along the Pacific coast of North and South America, to Japan, China, the Philippines, the Orient, Hawaii, New Zealand, and Australia, as well as services to the Canal, to Atlantic coast points, and Europe.

In 1920 there were over 2,500 factories in San Francisco, giving employment to more than 55,000 wage-earners. Shipbuilding construction during and following the World War became one of the most important industries. In 1919 there were launched 53 vessels, of which 50 were steel, 2 wood, and one concrete. At the end of that year there were 31 steel vessels under construction. During 1919 there were launched 49 naval craft, including one battleship, 4 gunboats, 31 destroyers, 7 submarines, and 6 tugs. At the close of that year there were 61 naval craft under construction. The total exports of the city in 1919 amounted to $235,685,879. The total imports amounted to $238,074,061. The leading industries include the manufacture of boots and shoes, bread and bakery products, clothing, copper, tin and sheet iron products, printing and publishing products, foundry and machine shop products, and flour and grist mill products.

There were in the city in 1920, 37 banks, with 19 branches. The bank clearings amounted to $7,286,339,237. The resources of the National banks aggregated $527,780,951, and the deposits $359,619,941. The assessed valuation of real estate in 1919 was $297,741,765. The total valuation was $794,459,406. The bonded indebtedness was $44,259,600. Pop. (1900) 342,782; (1910) 416,912; (1920) 506,676.

History.—As early as 1769 a number of Franciscan fathers established a mission here, and seven years later the Spaniards chose the place for a military post. In 1835 an Englishman erected the first tent on the site of the present city, in Yerba Buena, 3 miles from the mission. A village which soon grew up was united with the mission in 1846. Two years later when gold was discovered adventurers from all parts of the world entered California and by 1850 San Francisco had a population of 25,000. During the latter year a city charter was received, and in 1856 the county and city were consolidated. Owing to corrupt municipal management in 1850-1851 a vigilance committee was organized by the law-abiding citizens who dealt severely with criminals and succeeded in establishing good government. In 1897, after four ineffectual attempts, a city charter was adopted by the people which contains a civil service system, provides for the initiative and referendum, and limits taxes to $1 per $100 for municipal purposes. April 18, 1906, the city experienced a very destructive fire with loss of innumerable buildings, estimated 800 lives and $300,000,000 worth of property. The rebuilding of the city was one of the most remarkable examples of civic enterprise ever known.

SAN FRANCISCO BAY, a land-locked arm of the Pacific Ocean, on the coast of California. It is the finest bay on the W. coast of the United States; is connected with the Pacific Ocean by a strait called the Golden Gate; extends S. by S. W.; washes the shores of Alameda and Contra Costa counties, and reaches from Sonoma co. to Alviso. Including San Pablo at its N. point, it is 55 miles long. It varies in breadth from 3 to 12 miles. The shores of the Golden Gate are bold and rocky, rising on the N. to nearly 200 feet; on the S. the hills are sand-covered, 300 to 400 feet high. The bar has a depth of 30 feet of water at low tide; within it is much deeper. There are several islands, including Alcatraz, 4 miles from the entrance, Angel, and Yerba Buena, or Goat. The entrance is defended by fortifications on Alcatraz Island and Fort Point S. of the Golden Gate. The bay is connected N. by a strait, 3 miles wide, with San Pablo Bay about 10 miles across, and nearly circular, and this again is connected by Carquinez Strait, 1 mile wide, with Suisun Bay, 8 miles long, and 4 miles wide. Both these bays are deep, but Carquinez Strait has only 16 feet of water at low tide. This bay is large enough to float all the navies of Europe at once.

SAN FRANCISCO CAPE, a cape in South America, on the coast of Ecuador.

SAN FRANCISCO MOUNTAINS, the loftiest mountain group in Arizona, its highest summit being Humphrey's Peak,

12,794 feet above sea-level. This peak is 85 miles N. E. of Prescott. It is near the S. border of the Colorado plateau, and it rises 5,000 feet above the level of this plateau. Near it are volcanic cones long since extinct.

SANGAMON RIVER, a river in Illinois formed by the North and South Forks, the former being the main branch. Its source is near Gibson, whence it traverses Champaign co., where it turns W. and crosses Sangamon co., and forms the N. boundary of Cass co. It flows into the Illinois river about 9 miles above Beardstown, and 45 miles W. N. W. of Springfield. Its length is 250 miles, including the North Fork. The forks join 6 miles E. of Springfield.

SANGER, WILLIAM CARY, an American public official, born in Brooklyn, N. Y., in 1853. He graduated from the Polytechnic Institute of Brooklyn in 1869, and from Harvard in 1874. From 1895 to 1897 he was a member of the New York Assembly. During the Spanish-American War he served as lieutenant colonel of the 203d New York Infantry. He was assistant secretary of war from 1901 to 1903. In 1906 he was one of the American delegates to the International Red Cross Conference, held in Geneva, to revise the treaty of 1864. He was a member of the war relief board of the National Red Cross, and during the World War was director of military relief for the Potomac Division of the American Red Cross. He wrote several reports on military conditions in Europe and contributed articles on military subjects to magazines.

SANGIR ISLANDS, a group of small islands in the Indian Archipelago, between the N. E. extremity of Celebes and the Philippine isle of Mindanao. Most of them are inhabited and are covered with cocoa palms. Rice, pisang, and sago are cultivated. The islands are all mountainous and partly volcanic. In an eruption of Aboe, a volcano on Great Sangir, in June, 1892, the greater part of the island was devastated, and nearly 10,000 inhabitants perished. The natives are of the Malay race and profess Christianity. The islands belong to the Netherlands. Pop. about 114,000.

SANGREALIS, SANGREAL, or **SAINT GRAIL**, the Holy Cup or Grail, said to be from Modern Latin *gradale*, a cup; but supposed by some to be a corruption of the Old French *le Sang Real, i. e.*, the true blood of Christ. This sacred relic, preserved in an emerald cup, is said in legendary history to have been brought to England by Joseph of Arimathea. According to the romantic story of King Arthur it could only be discovered by one possessed of perfect virtue; and the "Quest of the St. Grail" by the Knights of the Round Table, of whom the perfect champion, Sir Galahad (in other legends Parsifal), was favored by its discovery, is narrated therein at great length.

SANGSTER, MARGARET ELIZABETH (MUNSON), an American poet; born in New Rochelle, N. Y., Feb. 22, 1838. She was editorially connected with "Hearth and Home" (1871-1873) and "The Christian at Work" (1873-1879); and in 1889 became editor of "Harper's Bazar." Her most noted poems are: "Our Own"; "The Sin of Omission"; and "Are the Children at Home?" Among her books for girls are: "May Stanhope and Her Friend," and "Maidie's Problem"; "Little Knights and Ladies." She died in 1912.

SANGUINARIA, a genus of plants, order *Papaveraceæ*. The most interesting species is *S. canadensis*, the puccoon, a native of North America. Its root, often called blood-root, from its containing a red juice, is used internally in large doses as an emetic and purgative, and in small doses as a diaphoretic and expectorant. It is applied externally, combined with chloride of zinc, to check cancerous growths.

SANHEDRIM, or **SANHEDRIN**, the supreme national tribunal of the Jews, established at the time of the Maccabees, probably under John Hyrcanus. It consisted of 71 members, and was presided over by the Nasi ("prince"), at whose side stood the Ab-Beth-Din ("father of the tribunal"). Its members belonged to the different classes of society: there were priests (Greek, *archiereis*), elders, that is, heads of families, men of age, and experience (Gr. *presbyteroi*); scribes, or doctors of the law (Gr. *grammateis*); and others exalted by eminent learning—the sole condition for admission into this assembly. The presidentship was conferred on the high-priest in preference, if he happened to possess the requisite qualities of eminence; otherwise, "he who excels all others in wisdom" was appointed, irrespective of his station. The limits of its jurisdiction are not known with certainty; but there is no doubt that the supreme decision over life and death were exclusively in its hands.

By degrees the whole internal administration of the commonwealth was vested in this body, and it became necessary to establish minor courts, similarly composed, all over the country, and Jerusalem itself. Thus we hear of two inferior tribunals at Jerusalem, each of

them consisting of 23 men, and others consisting of three men only. These courts of 23 men (Lesser Synedrion), however, as well as those of the three men, probably represent only smaller or larger committees chosen from the general body. Excluded from the office of judge were: those born in adultery; men born of non-Israelite parents; gamblers; usurers; those who sold fruit grown in the Sabbatical year; and, in individual cases, near relatives. All these were also not admitted as witnesses. Two scribes were always present, one registering the condemnatory, the other the exculpatory votes. The mode of procedure was exceedingly complicated; and such was the caution of the court, especially in matters of life and death, that capital punishment was pronounced in the rarest instances only. The Nasi had the supreme direction of the court and convoked it when necessary. He sat at the head, and to his right hand was the seat of the Ab-Beth-Din.

The court met on extraordinary occasions in the house of the high priest; its general place of assembly, however, was a certain hall (*Lishcat Hagaziz*), probably situated at the S. W. corner of one of the courts of the temple. With the exception of Sabbath and feast days it met daily. The political troubles forced the Sanhedrin (70 B. C.) to change its meeting-place, which was first transferred to certain bazaars (*Hannyoth*) at the foot of the temple mount. After the destruction of the temple and Jerusalem it finally established itself, after many further emigrations, in Babylon.

The question as to the origin and development of the Sanhedrin is a difficult one. It is said it was intended to be a faithful reproduction of the Mosaic assembly of the 70 (Moses himself making 71), supposed to have been re-established by Ezra after the Exile.

SANITARY LAWS, statutes or regulations for the protection of the public health. Sanitary laws may be divided into two classes: first, those instituted by legislation, providing for quarantine protection, the practice of medicine and conduct in public places. Tenement house laws, regulating the construction of habitations, size of rooms and cubic space per member of families domiciled, also come under this head. The second class includes such ordinances or regulations as govern the disposal of sewage, the regulation or protection of the water supply, conditions under which meat and other foods must be stored and distributed, and the erection of public sanitaria and public baths. It is only within recent years that the protection of public health has been made the object of special legislation, since the teachings of science have demonstrated the possibility of prevention against contagious diseases. It has been legislation of this kind which has practically put an end to violent epidemics, especially of what are generally known as the dirt diseases, such as cholera and small pox.

SANITARY SCIENCE, the science which deals with the preservation of health and the prevention of disease. Considered broadly, disease is due to environmental conditions which cause injury of the living body. The causes of disease are usually divided into the external, which act from without, and the internal, due to imperfection of the body, but these imperfections in the first instance are due to external causes. Sanitary science then comes to be the study of the influence of unfavorable environmental conditions on the body during the entire course of life from conception to death. Public health, which deals with disease causes, of such a character as to produce an effect on the general population, personal hygiene or the preservation of the health of the individual, infectious diseases and the measures of protection against them, the influence of age, climate and occupation on health, water supplies, the nutritive values of foods and the methods of marketing and preserving foods, methods of the disposal of waste material, the construction of dwellings and factories and the influence of factory life on the workers, vital statistics by means of which the state of health of a community can be ascertained, social pathology or the influence of poverty and social conditions in the production of disease; all these and many more are considered under sanitary science, and for the most part form separate departments of it.

Health of its people is considered the most important asset of a state, and nothing contributes more to happiness and well being. Sickness renders the state not only less efficient in production and less capable of defense, but the care of the sick and indigent, for poverty and sickness go together, is an enormous tax upon the well. Good health is not even a matter of individual choice, but for the sake of the well-being of society the individual is restrained from actions which would be injurious to himself or to others. A great mass of laws, national, state and local, designed for the protection of the people against disease, have been enacted and large sums of money from

the public funds appropriated to further health measures. All conditions affecting health have increasingly become the subject of intense study and a large amount of knowledge based upon experience and experiment is now available. As in all matters which involve consideration of living things there is still much which is uncertain, and with the scientific knowledge there is intermingled much supposed knowledge based merely upon tradition and insufficient experience. Great changes are taking place, such as the increasing industrialism bringing with it the depletion of the rural population and the increase of the urban, the greater facility of transportation increasing the range of the environment, and the full effect of such changes upon the general health cannot yet be fully ascertained. There is still lacking such information of the conditions in the past as to afford a proper basis for comparison with the present. We do not accurately know whether or no the general health of the people has been affected by the influence of modern conditions. From such statistics as have been gleaned from the medical examination of large numbers of drafted men in the late war, the figures show a large percentage of individuals who have become defective through disease. These statistics represent the general health of the males of military age in the state. In Great Britain the medical examinations have shown that of every nine men there were three perfectly fit and healthy; two were upon a definitely infirm plane of health and strength, whether from some disability or failure of development; three men were incapable of undergoing more than a very moderate degree of physical exertion, and could in justice to their age be described as physical wrecks, and the remaining man was a chronic invalid with a precarious hold upon life. This examination brought out also the effect of occupation upon health, the agricultural population having the best showing, with a decided fall in the industrial occupations, culminating in the tailors and barbers. The examination of the drafted men in the United States showed that in the total male population of military age there were four hundred and sixty-five defective individuals of every thousand examined. Although these examinations were of males only, there is no reason to think that the females would have made a better showing, for the causes act upon all alike. Certain districts in London, where overcrowded and bad hygienic conditions notoriously exist, showed an enormously higher percentage particularly of respiratory diseases, affording a striking illustration of the baneful influence of bad environmental conditions in relation to these particular diseases, and in almost every other disease these black list districts showed a higher percentage than did the normal areas. The numerical registration and tabulation of population, marriages, births, diseases and deaths, with analysis of the resulting phenomena is not of recent origin, but the development of their present form and the accuracy attained is comparatively modern. There is difficulty always in the carrying out of laws, the necessity for which is not perfectly understood. They are not efficient without the co-operation of the people, and this co-operation can be attained only through education. For this purpose the instruction of school children in the elementary principles underlying health preservation, and inculcating in them good habits of life is of the utmost importance. The care of these children during school attendance is assumed by the state, and their education in measures of health control is not less important than the other branches of study.

SANITATION, that department of human knowledge which regards the laws of the human body, and of the agents by which it is surrounded, with a view to the preservation of health and the warding off of disease and death. The practical application of these laws constitutes hygiene, or the art of preventing disease. See SANITARY SCIENCE.

SAN JACINTO, BATTLE OF, a notable battle that decided the independence of Texas. It was a desperate engagement between a Mexican force in command of Santa Ana, 1,600 in the ranks, and 783 Texans led by Sam Houston, April 21, 1836. The Mexicans were defeated and utterly routed. The scene of this event was on the banks of the San Jacinto river, 17 miles E. by S. of the present city of Houston.

SANJAK (Turkish, a standard), the name given to a subdivision of an eyalet or minor province of Turkey, from the circumstance that the governor of such district is entitled to carry in war a standard of one horse-tail.

SAN JOAQUIN, a river of California, 350 miles long; rises in the Sierra Nevada mountains, in Fresno county, flows S. W. about 70 miles, then N. W., and unites with the Sacramento near its mouth in Suisun Bay. Tulare Lake discharges into it at high water. It is navigable at all seasons by vessels of from 150 to 250 tons to Stockton, about

50 miles; in winter and spring steamers ascend nearly 200 miles further. Its chief tributaries are the Fresno, Mariposa, Merced, Tuolumne, Stanislaus, and Calaveras. The San Joaquin valley is world famed for its fertility.

SAN JOSÉ, a city and county-seat of Santa Clara co., Cal.; on the Guadalupe and Coyote rivers, and on the Southern Pacific railroad; 51 miles S. of San Francisco. It contains the State Normal School, the University of the Pacific (M. E.), the College of Notre Dame, the State Asylum for the Chronic Insane, United States Government building, Platt Home for Old Ladies, public library, Hall of Justice, Hall of Records, parks, hospitals, and court house. The city has electric street railroads, electric lights, National and State banks, and daily, weekly, and monthly periodicals. Its manufacturing interest is large, including a woolen mill, silk factories, lumber mills, tanneries, iron foundries, machine shops, and canning establishments. It is the center of an important fruit growing region. The city was established in 1782 by Spaniards, and was the capital of California under its first constitution. Pop. (1910) 28,946; (1920) 39,642.

SAN JOSÉ, capital of the republic of Costa Rica, Central America. It stands on a table-land 4,500 feet above the sea-level. The streets are broad, and there are few public buildings worthy of note. It is the center of the trade of the state. The climate is healthy, and the town is surrounded with coffee plantations. Pop. about 38,000; with suburbs, 52,000.

SAN JOSÉ SCALE, in entomology the *Aspidiotus perniciosus*, a minute tree louse, that is particularly destructive to orchards. It is no larger than a fly speck, and is often mistaken for such when appearing on fruit, but when examined with a microscope it is a most formidable six-legged insect. Though named from an American city, the San José scale is a native of Mexico. It has found its way into the United States and many parts of Europe, having been carried from country to country in shipment of fruit. It drains the juices from the trees, destroying the bark by sapping its life away.

SAN JUAN, a province of the Argentine Republic in the W. part; separated from Chile on the W. by the Andes mountains. It is partly mountainous and partly covered by waterless, frequently sandy, plains. Besides the main chain of the Andes, the sub-Andean chain of the Sierra del Tontal, Sierra de la Huerta, 6,600 feet high, and others diversify the surface. In the extreme S. E. sandy plains occupy an area of 965 square miles, and here also lies the large lagoon of Guanacache. The principal rivers are the San Juan, the Jachal, and the Bermejo. The country is rich in minerals. Gold, silver, and copper are mined and there are local deposits in a few places. The mineral springs, chiefly sulphurous, are used in the baths at Laja, at Pismanta, and at Florida, near San Juan. The dry climate is against the cultivation of the soil, excepting near the rivers, where artificial irrigation is used, and where maize, wheat, lucerne, fruits, and grapes are grown. Agriculture is a chief industry. The wine of this province is excellent. Area 37,865 square miles. Pop. (1918) 127,713.

SAN JUAN, the chief pueblo of the Tewa division of the Tanoan Indians of North America; 26 miles N. W. of Santa Fé. These Indians occupy other pueblos in the Rio Grande valley, New Mexico, and have one in Arizona.

SAN JUAN, a river in Bolivia; a tributary of the Pilaya and a sub-tributary of the Pilcomayo. It is nearly 300 miles long. Another river in this country, in the province of Chiquitos, and an affluent of the Aguapehi, has the same name; length, about 200 miles.

SAN JUAN, a river in the Argentine Republic, in the province of San Juan, whose source is in the Andes; flows into the lagoon of Guanacache; length, about 250 miles.

SAN JUAN, the island now known as Porto Rico; named San Juan by Columbus and was so called till the 18th century. It was also known as San Juan de Porto Rico, from the name of its capital.

SAN JUAN, or **SAN JUAN DE LA FRONTERA**, a city of the Argentine Republic; capital of the province of San Juan; on the San Juan river; 92 miles N. of Mendoza. Pop. about 15,000.

SAN JUAN DEL NORTE, or Greytown. Nicaraguan seaport. Pop. about 2,500.

SAN JUAN DE PORTO RICO, the most important city and capital of the island of Porto Rico. It is a valuable seaport and is provided with strong fortifications. The city proper is on a small island, off the province of Bayamon, and adjacent to the N. coast. Its climate is healthful, and it is one of the most prosperous cities in the West Indies. The superior courts of the island meet in San Juan, and among the important buildings are, the bishop's palace, the

old government house, a large cathedral, custom house, the military hospital, a seminary, arsenal and jail. Under American supervision the city has been greatly improved in every respect. The harbor has been provided with facilities for docking large vessels, and the sanitary arrangements of the city have been modernized. Pop. (1920) 70,707.

SAN JUAN DE ULUA, or **SAN JUAN DE ULLOA**, a fort built on a small island of the same name, in the harbor of Vera Cruz, Mexico. It was constructed in the 17th century and was the strongest fortification owned by the country. It has been conspicuous in Mexican history.

SAN JUAN HILL, BATTLE OF. See SPANISH-AMERICAN WAR.

SAN JUAN ISLANDS, a group of islands now part of the State of Washington. They were occupied by both American and British garrisons in 1859, each nation claiming the right of exclusive possession. San Juan, Oreas, Lopez, and Shaw are the most valuable of the group.

SAN JUAN RANGE, a range of mountains in southern Colorado; a branch of the Rocky mountains, and a picturesque setting for San Luis Park. The highest peaks reach an altitude of over 14,000 feet.

SANKEY, IRA DAVID, an American evangelist; born in Edinburgh, Pa., Aug. 28, 1840; was associated with the evangelist, the late DWIGHT L. MOODY (*q. v.*), for some years, attracting and holding the attention of great audiences by singing hymns composed by himself. His religious music became so popular that he published several hymn books under different titles, which are all included in church and Sunday-school service. He died Aug. 13, 1908.

SANKHYA, in Brahmanism, one of the six systems of Brahmanical philosophy. It was founded by Kapila.

SAN LEANDRO, a city of California, in Alameda co. It is on the Southern Pacific and the Western Pacific railroads. Its industries include lumber mills and hay-press works. Pop. (1910) 3,471; (1920) 5,703.

SAN LUIS DE POTOSI, a city of Mexico; capital of the State of the same name; 198 miles N. W. of Mexico, 6,350 feet above sea-level; regularly built, with fine streets. It has a handsome cathedral; manufactures of clothing, shoes, hats, etc.; railway work shops; and a considerable trade. Pop. about 68,000. The State has an area of 25,316 square miles, is generally fertile, and has rich gold and silver mines. Pop. about 630,000.

SAN LUIS OBISPO, a city of California, the county-seat of San Luis Obispo co. It is on the Southern Pacific and the Pacific Coast railroads. Its public institutions include the California Polytechnic School, a Carnegie library, an Elks home, and a Masonic Temple. The city contains the Mission of San Luis Obispo, founded in 1772. It has the city division headquarters and shops of both railroads which enter it. Pop. (1910) 5,157; (1920) 5,895.

SAN LUIZ DE MARANHAM. See MARANHAM.

SAN MARINO, the smallest republic in Europe, and one of its most ancient States; is inclosed by the provinces of Forli and Pesaro and Urbino, of the kingdom of Italy; situated 9 miles S. W. of Rimini. The legislature of the republic is a senate of 60 members, elected one-third every three years from the nobles, citizens, and peasants. Two presidents are chosen by the senate every six months, called captains regent. Two secretaries of state and two legal functionaries are the other government officials. This little republic occupies a great, rocky, mountainous site, about 2,420 feet high, precipitous on all sides, with intervening dense forests and valleys of fertile land. The town is built round a hermitage, founded in 441, and is accessible by but one road. It is surrounded by great walls and has three forts. The wealthier citizens reside in the suburb of Borgo. The manufacture of silk is the chief industry of the town. Many of the buildings are stately and remarkably massive in structure, including the governor's palace, and six churches, one of which contains the tomb and statue of St. Marino. There are several schools, museums, a theatre, a town hall, and two convents. Two immense cisterns provide the public with water. The inhabitants are principally engaged in agriculture. The military number 950 men. From the 10th to the 13th centuries the inhabitants succeeded in maintaining their independence, which was recognized by the Church in 1291, and confirmed by the Pope in 1631. The treaty with Italy of 1907 was revised in 1914. In 1915 the republic declared war on Austria. Area of the republic, 38 square miles; pop. (1919) 11,944.

SAN MARTIN, JOSÉ DE, a Spanish-American general; born in Yapeyu, Misiones, Argentine Republic, Feb. 25, 1778. He was in the Spanish campaigns against France from 1793 till 1811, attaining the

rank of lieutenant-colonel. He resigned from service and sailed for Buenos Ayres in 1812, where he joined the patriot army. In the following year he was placed in command of their forces, serving in upper Peru or Bolivia. He opened a line of operations through Chile, abandoning the previous plan of attacking the Spanish forces in Peru by way of Chuquisaca and Lake Titicaca. San Martin was supported by the supreme director, Pueyrredon, in his purpose. An army of invasion was drilled for two years at Mendoza, and then San Martin in command of 4,000 men began, Jan. 17, 1817, his famous march over the Andes, leading his force through the Nepallata Pass, 12,800 feet high. On Feb. 12, 1817, he gained the victory of Chacobuco, which was followed by the capture and occupation of Santiago, Feb. 15. He was defeated on March 19, 1818, at Cancha Rayada, but gained a splendid victory on April 5 at the Maipo, which drove the Spaniards from Chile. He was offered the supreme directorship of Chile, but declined it and began preparations for the invasion of Peru. He organized a navy, and his small force of 4,500 men sailed for the Peruvian coast. After much adventurous manœuvering, this army captured and occupied Lima, July 9, 1821, and carried Callao through hard fighting soon after. On Aug. 3, San Martin was proclaimed supreme protector of Peru. At this time Bolivar was leading an army S., and the success of the patriots was threatened by civil war. San Martin gave way to his rival, "for the good of the cause," so averting a contest which might have destroyed the country's independence. On July 26, 1822, he held an interview with Bolivar, after which he resigned his office to the Peruvian Congress, Sept. 22, leaving Bolivar to complete the independence of Peru. San Martin retired from South American affairs, went to France and lived there in reduced circumstances till his death in Boulogne, France, Aug. 17, 1850.

SAN MATEO, a city of California, in San Mateo co. It is on San Francisco bay and on the Southern Pacific railroad. Its public institutions include a library, city hall, clubs, etc. It is a residential city and has many beautiful homes. It has important salt, fishing, and agricultural interests. Pop. (1910) 4,384; (1920) 5,979.

SAN MATIAS, GULF OF, an indenture of the Atlantic Ocean in the E. coast of Argentina.

SAN MIGUEL, a city of the republic of Salvador, about 69 miles E. of San Salvador on the slope of the volcano of San Miguel or Jucuapa. It is well built and is a leading city of the republic, the trade center of a fertile agricultural territory, and the capital of the San Miguel department. It has several fine churches and open places and has important foreign trade connections. Pop. about 30,000.

SAN PABLO BAY, an arm of the Pacific Ocean which penetrates California and is connected with San Francisco bay. In it is Mare Island. It washes the shores of Sonoma, Contra Costa, and Marin counties. It is united with Suisun bay by the strait of Carquinez, the outlet of all the water which collects in the great central valley of the state. Length, 13 miles.

SAN PAULO. See SÃO PAULO.

SAN RAFAEL, a city of California, the county seat of Marin co. It is on San Pablo bay and on the Northwestern Pacific railroad. It is a popular resort and contains the Hitchcock Military Academy, Mount Tamalpais Military Academy, a Dominican college, a high school, baths, etc. Pop. (1910) 5,934; (1920) 5,512.

SAN SALVADOR, the capital of the republic of Salvador, Central America. It is nearly in the center of the country. The city is for the most part attractively built. Many of the large buildings are constructed of wood, among these being the cathedral. The noteworthy edifices are the national palace, the president's house, the university, national library, astronomical observatory, and botanical garden. It is an important commercial center, having an extensive trade in agricultural products, especially indigo and tobacco. Pop. (1920) 80,100.

SAN SALVADOR, a name given by Columbus to the first island he discovered in the New World, Oct. 12, 1492. This island was later identified with Cat island and still later with Watling island.

SANS CULOTTES (*French*, without breeches). (1) A fellow without breeches; a rough, ragged fellow. The name was applied in derision to the popular party by the aristocrats in the beginning of the revolution of 1789, and was afterward assumed by the patriots as a title of honor. (2) A fierce republican. (3) A rough.

SAN SEBASTIAN, a city and seaport in the N. E. of Spain; capital of the province of Guipuzcoa, partly on the side of Mount Urgull, which projects into the Bay of Biscay, and partly on the isthmus connecting it with the mainland. It was

once strongly fortified, its fortifications including the castle of Mota on the summit of Urgull, 493 feet high. The town, which was destroyed by fire in 1813, consists for the most part of modern houses arranged in spacious streets and squares. The manufactures consist chiefly of cordage, sail cloth, leather, candles, and soap. The trade has greatly decayed; but the place is much frequented for sea bathing. San Sebastian is of considerable antiquity, and having by its early fortification become the key of Spain on the side of France, figures much in all the wars between the two countries. In 1813 it was stormed by the British. Pop. (1918) 57,282.

SANSKRIT, the name of the ancient literary language of India. It forms the extreme branch of the great Indo-Germanic (Indo-European, Aryan) stock of languages, and the one which, thanks to its early literary cultivation (from 1500 B. C.) and grammatical fixation, and its consequent transparency of structure and fulness of form, approaches nearest to the parent language. In some respects, however, the primitive appearance of the Sanskrit, as of the closely allied Iranian or Persic branch, is now generally ascribed to a special Indo-Iranian development, or to a later return to a phonetic phase already outgrown by the parent language at the time of the separation. While it is admitted on all hands that the Aryan dialect, out of which the literary language of India has developed, cannot have been indigenous to the peninsula, but must have been introduced from the N. E., there is still considerable difference of opinion as to the original home of the primitive Aryan community—whether it is to be sought for in Asia, as used to be universally believed, or whether, as many scholars are now inclined to think, it was from some part of Europe that the Asiatic Aryans originally came. On entering India, the Aryan tribes found the country occupied by people of different races; but, favored by physical and intellectual superiority, they gradually succeeded in extending their sway, as well as their language and their social and religious institutions, over the whole of northern India.

Though the term Sanskrit, as the "perfected" language, properly speaking only belongs to the grammatically fixed form of the language which was employed from about the 4th or 5th century B. C., and which came more and more to assume the character of a mere literary and learned idiom, it is usual to extend the term so as to include an earlier form of the same language used in the Vedic writings, and hence often called Vedic Sanskrit. The two phases of the language show considerable differences as regards both vocabulary and grammar.

In accordance with the general development of the language, the history of the ancient literature of India may conveniently be divided into two chief periods, the Vedic Literature and the (Classical) Sanskrit Literature.

The Hindus possess two great national epics, the "Mahâbhârata" and the "Râmâyana." Along with these may be classed the "Purânas," which, though in their present form they were doubtless composed or recast for sectarian purposes several centuries after Christ, seem to contain a considerable amount of genuine old legendary matter akin to large portions of the Mahâbhârata. Though the final redaction of the two epics can scarcely be assigned to an earlier period than about the beginning of our era, it can hardly be doubted that the vast mass of legendary lore and complete epic lays of which the Mahâbhârata is composed, at all events must have required centuries to grow and assume its present shape. At a subsequent period, from about the 5th or 6th century A. D. onward, there arose a second crop of epic poems, artificial in style, product of an age when the literary language had long lost touch of the popular mind. Their subject-matter, such as there is, is entirely derived from the old legends; but the form in which it is here presented has nothing of the old popular ring about it. Of such poems (*kâvya*) there existed a considerable number; but the native taste has singled out six of them as *mahâkâvyas* or great poems—viz., two by Kâlidâsa, by far the greatest poet of this period, the "Raghuvam'sa" and the "Kumârasambhava"; further the "Kirârtârjunîya" by Bhâravï (probably a contemporary of Kâlidâsa, 500-550 A. D.); the "S'is'upâlabadhâ" by Mâgha, hence also called "Mâhakâvya," the "Râvanabadha" or "Bhattikâvya," composed by Bhatti with the view of illustrating the less common grammatical forms of speech; and the "Naishadhïya" of S'ri Harsha (12th century).

While the main body of the Vedic hymns are the immediate outgrowth of a worship of the elemental forces of nature, not a few of the hymns, especially the later ones, evidence a strong tendency toward metaphysical speculation. It is only in the "Upanishads," however, that we meet with the first attempts at some kind of systematic treatment of the great problems of mundane existence, and of the nature of the absolute spirit and its relation to the human mind. The drift of speculative inquiry in those days, as ever afterward, is determined by two

cardinal notions which are never questioned, and have assumed the force of axioms in Hindu philosophy—viz., the pantheistic notion of the spiritual unity of all sentient beings, and the transmigration of souls.

Six philosophical systems are recognized by orthodox Hindus, which fall, however, into three pairs so closely connected that each pair forms a common school of philosophy—viz., "Mîmâmsâ" and "Vedânta," "Sânkhya" and "Yoga," "Nyâya" and "Vai'seshika." Nothing certain is as yet known as to their date or order. The tenets of each system are propounded in a manual of concise aphorisms, ascribed to the respective founders, and commented on by numerous writers.

The "Vedânta," *i. e.*, "end of the Veda" —as the "Uttara-Mîmâmsâ" ("Later Inquiry") is more commonly called—is the system most closely in accord with the development of religious thought in Brahmanical India. According to this system, God is the omniscient and omnipotent cause, efficient as well as material, of the world: He is both creator and nature; and at the consummation of things all are resolved into Him.

The individual soul is of the same essence as the supreme one; it emanates from Him like one of the sparks that issue from a blazing fire, and ultimately returns to Him. It is not a free agent, but ruled by God; its activity—the source of its suffering—being solely due to its bodily organs.

The "Yoga" school, founded by Patanjali, accepts the speculative system of the Sânkhya with its 25 principles; but adds thereto a 26th—viz., the "self devoid of attributes," the supreme god of the school, whence the "Yoga" is also called the Theistic Sânkhya.

SAN STEFANO, TREATY OF, a treaty which put an end to the Russo-Turkish War; concluded March 3, 1878, at San Stefano, a town W. of Constantinople and a port on the Sea of Marmora. By its terms Bulgaria was to become a principality, extending from the Danube to the Ægean, and Rumania, Servia, and Montenegro were recognized as independent. Russia was to receive a war indemnity of 300,000,000 roubles, and the Dobrudja, Kars, Batum, and other possessions. The congress held at Berlin, in June and July, 1878, greatly altered the provisions of this treaty, effecting peace on somewhat more moderate terms.

SANTA ANA, a city of California, the county-seat of Orange co. It is on the Southern Pacific and the Atchison, Topeka, and Santa Fé railroads, and the Pacific Electric railway. Its public institutions include two libraries and a polytechnic high school. It has several large beet sugar factories. Pop. (1910) 8,429; (1920) 15,485.

SANTA ANA, or SANTA ANNA, ANTONIO LOPEZ DE, a Mexican president; born in Jalapa, Mexico, Feb. 21, 1795. He took a prominent part in the expulsion of the Spaniards from Mexico, and proclaimed the Mexican Republic in 1822. He was in the front during all the Mexican troubles till 1833 when he became president. In 1836 he was defeated and taken prisoner by the Texans, but returned the following year. He was again president in 1846 and commanded in the war with the United States (1846-1848). After General Scott's occupation of the City of Mexico, in September, 1847, he resigned and left the country, but was president in 1853-1855. He died in the City of Mexico, June 20, 1876.

SANTAYANA, GEORGE, a Spanish-American poet and educator; born in Spain in 1863. He was assistant Professor of Philosophy at Harvard, and published: "Sonnets and Other Poems," and "The Sense of Beauty: An Outline of Æsthetic Theory" (1896); "Lucifer: A Theological Tragedy" (1899); "Interpretations of Poetry and Religion" (1900); "The Hermit's Christmas" (1901); "The Life of Reason" (5 vols. 1905-1906); "Three Philosophical Poets; Lucretius, Dante and Goethe" (1910); "Winds of Doctrine" (1913), etc.

SANTA BARBARA, a city and county-seat of Santa Barbara co., Cal.; on Santa Barbara channel, and on the Southern Pacific railroad; 362 miles S. E. of San Francisco. It is located in a region of equable climate, which makes it famous as a midwinter health resort. It is also in a section rich in agriculture and stock raising, and in the production of fruit and wool. Here are a State Normal School of Manual Arts, St. Anthony's College, City hall, Federal building, parks, a high school, libraries, street railroad and electric light plants, many mineral springs, National and State banks, and daily and weekly newspapers. There is a fine harbor, and daily steamboat service N. and S. Santa Barbara exports English walnuts, olive oil, lima beans, and citrus fruits. Pop. (1910) 11,659; (1920) 19,441.

SANTA BARBARA CHANNEL, a passage of the sea between San Miguel, Santa Rosa, Santa Cruz, and Anacapa islands of the Santa Barbara group, and the coast of California; its width varies from 20 to 30 miles.

SANTA BARBARA ISLANDS, a group of islands off the coast of California, extending about 175 miles. They lie opposite Santa Barbara, Los Angeles, and San Diego counties, at a distance varying from 20 to 65 miles. They are nine in number, and consist of San Miguel, Santa Rosa, Santa Cruz, Anacapa, Santa Barbara, Santa Catalina, San Clemente, San Nicholas, and San Juan.

SANTA CATHARINA (-kä-tä-ree'nä), a maritime state of South Brazil, bordering on the Atlantic; area, 28,124 square miles; surface, mountainous, except along the coast, which is low; soil, generally fertile; climate, mild and healthy; productions, rice, manioc, millet, sugar, coffee, and cochineal. Chief towns: Desterro (capital, on Santa Catarina Island), São Francisco, and Laguna. Pop. about 441,300.

A fortified island of Brazil, off the coast of the above state, 30 miles long, and 8 broad. Surface, mountainous and well watered.

SANTA CLARA, a province of Cuba, in the central part of the island, with an area of 8,266 square miles. It is partly mountainous and partly plateau, much devoted to culture of sugar cane and tobacco. The province is traversed by a railroad connecting it directly with Havana. The capital, a town of the same name, is 185 miles east-southeast of Havana. The population of the province is (1919) 657,697.

SANTA CLARA, an inland city of Cuba, in the province of the same name, situated on the main line of the Cuban railroad, about 185 miles east-southeast of Havana. It is the second largest city in Cuba, with a population of (1919) 63,151. It is of considerable importance as a shipping point of the sugar and tobacco raised in that part of the island.

SANTA CLAUS. See ST. NICHOLAS.

SANTA CRUZ, a city and county-seat of Santa Cruz co., Cal.; on the San Lorenzo river, Monterey Bay, and the Southern Pacific railroad and several steamship lines; 76 miles S. of San Francisco. It is one of the best known watering-places in California, being situated on a sheltered and beautiful site on the N. shore of the bay. It contains a high school, public library, street railroad and electric light plants, waterworks, State banks, and daily, weekly, and monthly periodicals. Sequoia National park, containing the famous big trees, is a few miles distant. It has manufactories of soap, glue, lime, leather, powder, lumber, paper, bitumen, etc. Pop. (1910) 11,146; (1920) 10,917.

SANTA CRUZ, the capital and chief port of the Canary Islands on the N. E. coast of Teneriffe. The streets are well paved, but the houses are small and the public buildings few. There is an excellent harbor protected by a mole, and the coast is defended by a number of forts. Wine, brandy, tobacco, and cochineal are the chief exports. Pop. about 80,000.

SANTA CRUZ ISLANDS, an archipelago in the Pacific Ocean, between the New Hebrides and the Solomon Islands; area, 360 square miles. It is under British protectorate.

SANTA FÉ a city, capital of the State of New Mexico, and county-seat of Santa Fé co.; on Santa Fé creek, and on the Denver and Rio Grande, the Atchison, Topeka, and Santa Fé, and the New Mexico Central railroads; 20 miles E. of the Rio Grande, and 275 miles S. by W. of Denver, Col. The city contains a United States Government building, the Capitol built of cream sandstone, court house, the University of New Mexico, St. Michael's College (R. C.), Loretto Academy, New Mexico School for the Deaf and Dumb, schools for Indian boys and girls, the School of American Archæology, penitentiary, Roman Catholic Orphan Asylum, St. Vincent's Hospital, etc. There are also waterworks, electric lights, a National bank and daily and several weekly newspapers. The industries consist principally of farming, mining, and stock raising. The climate is very agreeable. In the old city the unpaved streets are narrow, crooked, and ancient looking, and the buildings are nearly all of adobe and one story high. When first visited by the Spaniards, about 1542, the town was a populous pueblo. Pop. (1910) 5,072; (1920) 7,236.

SANTA MONICA, a city of California, in Los Angeles co. It is on the Pacific Ocean, and on the Pacific Electric railroad. Its fine bathing and boating facilities make it a popular summer resort. It has a large amusement pier and a concrete pier of over 1,600 feet long. Its notable institutions include a library, St. Catherine's Hospital, and the Santa Monica Military Academy. Several motion picture concerns have their studios here. Pop. (1910) 7,847; (1920) 15,252.

SANTANDER, a seaport on the N. coast of Spain; on an inlet of the Bay of Biscay, about equally distant from Oviedo on the W. and San Sebastian on the E.; 316 miles N. of Madrid. The bay on which it stands is accessible to the largest vessels at all times. The town occupies a picturesque site, but is quite

modern in appearance. Of its former convents one now serves as a theater, another a cigar factory. The remaining industries are chiefly breweries, cotton, paper, and flour mills, iron foundries, and ship-building yards. The commerce of the port increases steadily: the exports—flour, wine, foodstuffs, and metals—have in some years reached a value of about $5,000,000, and the imports—tobacco, foodstuffs, codfish, iron and steel goods, textiles, coal, petroleum, chemicals, timber, upward of $10,000,000. Santander is a favorite seaside resort in summer. It was here Charles I. embarked for England after his trip to the Spanish court. The town was sacked by Soult in 1808. Pop. (1918) 72,700.

SANTA ROSA, a city and county-seat of Sonoma co., Cal.; on Santa Rosa creek, and on the Southern Pacific, the Petaluma and Santa Rosa and the Northwestern Pacific railroads; 52 miles N. by W. of San Francisco. It is in a fertile valley and has a delightful climate, highly adapted to the culture of grapes and other fruit. The experimental gardens of Luther Burbank are located here. It contains several educational institutions, a National bank, and daily and weekly newspapers. There are manufactories of iron, soap, carriages; fruit canning, etc. Pop. (1910) 7,817; (1920) 8,758.

SANTA TECLA, or **NUEVA SAN SALVADOR**, a city of the Republic of Salvador, 8 miles S. W. of the capital, San Salvador. It is a handsome town, with modern buildings, wide plazas, hospital, schools, and interesting churches. It is in the center of a picturesque valley, being within view of the volcano of the same name, and represents an attempt to establish a new capital after the destruction of San Salvador city by an earthquake in 1854. Pop. (1920) 23,291.

SANTIAGO, a province of Chile, inclosed by the Pacific on the W. and by Argentina in the E., with the provinces of O'Higgins and Colchagua on the S., and those of Aconcagua and Valparaiso on the N. It is very mountainous, but agriculture is highly developed in the valleys aided by artificial irrigation. There is some mining and salt is obtained from the coastal lagoons. The capital is Santiago. Pop. (1919) 640,087.

SANTIAGO, or **SANTIAGO DE CHILE**, the capital of Chile and of the province of Santiago, situated near the River Maipo in the central valley between the Andes and the coast range, 69 miles S. E. of Valparaiso. The site is picturesque, with a lofty inclosure of mountains filling the horizon. In the east the white summit of Aconcagua with some lesser heights of the Andes may be seen. The city itself is undulating and its central part is the red porphyry hillock of Santa Lucia, the stronghold of the first settlers besieged by the Arauconion Indians. It has magnificent streets and buildings, with highly developed street railways. The great apartment houses and private dwellings are extremely artistic and luxurious and its boulevards, among them the Alameda, are among the finest in America. The Hall of Congress, Exposition Palace, opera house, cathedral, University building, National library, National museum are all magnificent buildings. Pop. (1918) 415,641.

SANTIAGO, or **SANTIAGO DE LOS CABALLEROS**, a town of Santo Domingo; on the Yaqui river; is one of the most important towns of the republic, having large commercial interests and an extensive tobacco trade. Pop. (1917) 14,744.

SANTIAGO DE COMPOSTELA, a city of Spain; in the province of Corunna, and on the slope of Monte Pedroso. It is the see of an archbishop. The cathedral, begun 1082, is in the form of a Latin cross; near it is a large hostel, founded for pilgrims. The town was built around a chapel, afterward made the cathedral, on the site popularly believed to be the grave of the apostle St. James, whose bones are said to be in the foundation. For several centuries it was the most frequented place of pilgrimage of western Europe, and it has been called the "Mecca of Spain." The cathedral has a modern front, but part of the interior was built in the 9th century and is noted for its splendid proportions, lofty outline, and beautiful Gothic columns. There is a large hospital founded by Ferdinand and Isabella in 1504, and a university founded in 1504. There are many ruined convents in the city. It has numerous manufactures of hosiery, linen, cotton, silk, leather, paper, and wine, but its trade has much declined during the last four centuries. Pop. about 25,000.

SANTIAGO DE CUBA, a city, seaport, and capital of the province of the Oriente, Cuba; on a beautiful harbor opening through a narrow pass into the Caribbean Sea. It was made famous in the American-Spanish War by the splendid victory achieved by the American fleet outside of its harbor, and the later occupation of the city by American troops on the surrender of the Spanish army. The Spaniards claim that it is the oldest city in North America. It

was founded in 1514 by Diego Velasquez, the conqueror. Among the city's notable buildings are Morro Castle (1640); the Cathedral, Government House, the military barracks and hospital. When the American Government assumed control, July 17, 1899, of that portion of the province of Santiago included in the surrendered territory, industries were at a standstill and estates generally destroyed. Under American rule all was changed. Sanitation was introduced, schools and houses were built in destroyed towns, while public works supplied all willing to work with means for subsistence. Trade revived, estates were restored to a flourishing condition and prosperity returned to the city and province. Pop. (1919) 70,232.

SANTIS, or SENTIS, a mountain on the borders of the Swiss cantons of St. Gall and Appenzell, consists of three parallel ridges, separated by deep valleys and connected by lofty saddles. The highest point is 8,216 feet above sea-level. There are on the mountain, which commands very beautiful views, an observatory and a hotel.

SANTLEY, CHARLES, SIR, an English baritone singer; born in Liverpool, England, Feb. 28, 1834; acquired a knowledge of his art in Italy under Gaetano Nava, and in London under Garcia; appeared for the first time in 1857, and achieved his first great success at the Handel Festival in the Crystal Palace in 1862. He visited Australia 1889-1890 and the Cape of Good Hope in 1893, and made tours in Italy, Spain and the United States. After that he appeared constantly at oratorios, concerts, and operas as a baritone of great compass and finished expression. He wrote "Student and Singer," "The Art of Singing" (1906); "Reminiscences of My Life" (1909).

SANTO DOMINGO, a republic occupying the E. part of the island of Haiti, one of the Greater Antilles, West Indies. There are several mountain ranges running E. and W., between which are large and fertile plains. The country is well watered, the most important rivers being the Yaqui, Yuna, and Ozama. The coast is irregular, having a number of deep indentations which afford excellent harbors. The climate on the coast is hot and in some sections unhealthful. In the interior it varies, being mild and salubrious in the more elevated districts. Area 19,332 square miles. Pop. (1919) about 1,000,000, mostly negroes, and over 10,000 whites. Spanish is generally spoken in the country, French and English in the towns. Capital, Santo Domingo.

Religion and Education.—The State religion is Roman Catholic, though other forms of worship with certain restrictions are tolerated. There are in all 54 parishes. Primary education is free and obligatory. The public or state schools consist of primary, superior, technical, and normal schools, and a professional school similar to a university. In 1920 there were 972 schools, 26 secondary, one normal, one law and one medical school.

Government.—The Santo Domingo Constitution dates from 1844. Its Congress consists of a Senate of 12 and Chamber of Deputies of 24 members. Each of the 12 provinces is represented by one senator and two deputies. A U. S. Military Governor had supervision after 1916.

Commerce. — The imports in 1919 were valued at £4,403,825 and the exports at £7,920,378. The chief articles of import were cotton goods, iron and steel manufactures, rice, vegetable fibers, chemical products and drugs, leather and manufactures, and agricultural implements. The greater part of the sugar and cocoa are shipped directly to the United States and a large part is transshipped to Europe and Canada. The sugar exports in 1919 were valued at £20,697,761.

Finances.—The estimated revenue in 1919 was $7,973,000. The figures for expenditures indicated a surplus of $33,686. For the year 1920 the estimated entire revenue was $12,000,000. The expenditures were not expected to reach beyond $8,160,000. The Dominican Republic's chief source of revenue is the customs collections. A treaty concluded between Santo Domingo and the United States in 1907 authorized the issue of $20,000,000 in 5% bonds, secured by a first lien on the customs revenue of the Republic. By the terms of this treaty the President of the United States appointed a general receiver of Dominican customs, and a sinking fund was established for the service of the loan. In 1918 bonds were issued to the amount of $5,000,000 for the purpose of settling claims and indebtedness accumulated prior to the establishment of the military government.

History.—The early history of this portion of the island, which remained Spanish when the W. part was ceded to France in 1697, and which was united with the neighboring state in 1795-1808, and in 1822-1843, properly belongs to that of HAITI (*q. v.*). In 1843 it assumed a separate standing as the Santo Domingo republic, the anarchy and misrule of which it exchanged in 1861 for the despotism of its former masters. But the harsh Spanish rule brought on a

revolt in 1863. The Spaniards were driven out by a force headed by José Maria Cabral in 1865, and the constitution of 1844, with a few changes was reaffirmed. In 1905 the President of the United States undertook to adjust all the heavy financial obligations of the Dominican Government. In 1914 the United States sent a body of Marines to supervise the elections in Santo Domingo, and later American troops were employed to put down a revolt which arose in connection with the elections. Troops were retained in the Republic and it became virtually an American protectorate, and a Military Governor, who in 1920 was Rear-Admiral Thomas Snowden, was virtually the executive head of the island.

SANTONIN, in chemistry, $C_{15}H_{18}O_3$; santonic acid. The active constituent of the blossoms and seeds of *Artemisia santonica*, discovered by Kahler in 1830. It crystallizes in lustrous six-sided flat prisms, which melt at 168°-170°; insoluble in cold water, very soluble in alcohol and ether. It is much esteemed as an anthelmintic.

SANTORINI'S CARTILAGES, in anatomy, two small, yellowish, conical cartilaginous nodules, articulated with the tips of the arytenoid cartilages; named from their discoverer, G. B. Santorini, an Italian anatomist (1681-1736).

SANTOS, a seaport of Brazil, on the N. of the island of Engua Guacu, 34 miles S. S. E. of São Paulo. Its harbor is large and commodious, and it has an active trade in sugar and coffee. Pop. about 90,000.

SANTOS - DUMONT, ALBERTO, a French aeronaut; born in Brazil, South America, about 1874; was educated largely in France, and on the death of his father, made his home in Paris. He was much interested in the problem of aërial navigation and devoted his time and fortune to the solution of the question. In 1900 he made several partly successful attempts to fly with his dirigible balloon; but it was not until 1901 that he succeeded in perfectly controlling his machine in the face of a strong wind. In September, 1901, he won the Deutsch prize of $20,000 for the navigation of a flying machine under certain conditions. In January, 1902, he made several successful flights near Monte Carlo. Chevalier Legion of Honor 1904; officer in 1909.

SÃO-FRANCISCO, a river of Brazil, known in its upper course as the Paraopeba. It rises in the S. W. of the province of Minas Geraes, flows N. N. E. through that province and the province of Bahia, forms the boundary between the latter province and Pernambuco, and falls into the Atlantic 50 miles N. N. E. of the town of Sergipe del Rey; length, 1,600 miles, with numerous rapids and cataracts, which make its continuous navigation impossible.

SAÔNE, a river of France, rising in the department of Vosges. After a S. course of 300 miles, it joins the Rhône at Lyons. It is navigable for 232 miles.

SAÔNE, HAUTE (ōt sōn) (Upper Saône), a department in the east of France; area, 2,074 square miles. It is drained by the Saône, the Ognon, etc., and there are many small lakes. A part of the department belongs to the Vosges mountains. This, which comprises about a fourth of the whole, is rugged and the soil arid, but the low-lying basin is well watered and productive. In addition to cereals, flax and hemp are extensively cultivated; the ordinary fruits generally thrive well, and some districts are almost covered with cherry plantations. Iron is extensively worked, but the main occupations are agriculture and stockraising. Vesoul is the capital. Pop. about 257,000.

SAÔNE-ET-LOIRE, a department of France; area, 3,330 square miles. It is divided by a mountain range, which belongs to the Cevennes, and it takes its name from the two streams which bound the department on the S., E. and W. respectively. The soil on the whole is not of remarkable fertility, the finest part of the department being the valley of the Saône. The vine is extensively cultivated. The most important mineral is coal, of which there is an extensive field; iron is also worked. There are manufactures of leather, glass, linen and cotton goods; and the trade is chiefly in agricultural produce, coal, iron, wine, and leather. Mâcon is the capital. Pop. about 605,000.

SÃO PAULO, a state in the republic of Brazil; area, 112,278 square miles; stretches from the ocean to the Paraná river, and consists of a strip of coast land (8 to 80 miles broad) and an elevated region, the latter occupying all the interior, and rising from 1,600 feet; all this part is healthy, and the climate pleasant. The principal ranges are the Serras da Mantiqueira and do Mar. The rivers are numerous, and many of them of importance; regular steamboat service is maintained on many. Its mineral wealth includes magnetic iron, gold, marble, and precious stones. There is some cattle rearing and a few manufactures; but the chief industry is agri-

culture. The principal crop is coffee; next follow sugar, cotton, tobacco, manioc, maize, and grapes. The exports of the state—by either Rio de Janeiro or its own chief port, Santos—amount to almost 50 per cent. of the total for the republic. Pop. (1920) 4,823,100.

São Paulo, the capital, is on a plain bounded by low hills; 4 miles from the Rio Tiete and 210 W. by S. of Rio de Janeiro. It has a handsome public garden, and tramways running out to the beautiful suburbs. The principal buildings are the old Jesuit college, now the government palace, the bishop's palace, and a celebrated law school. São Paulo is the headquarters of the coffee trade, and railways connect it with the great coffee districts in the interior. There are cotton-weaving and printing works, and manufactories of tobacco, cigars, spirits, matches, gloves, and hats. Pop. (1919) 504,300.

SAP, the nutrimental fluid which circulates in plants. As it rises in the stem it is of a watery nature and contains the various inorganic matters absorbed by the roots, also some sugar, dextrine, and other organic substances which it has dissolved in its upward course. In its passage to the leaves it becomes more and more altered from the state in which it was absorbed by the roots; but when it reaches the leaves it is still unfitted for the requirements of the plant, and is hence termed crude sap. Through the action of the light and air it undergoes important changes in the leaves and other green parts, and becomes adapted for the nourishment of the plant. In this state it is termed elaborated sap. In dicotyledons this elaborated fluid descends through the internal bark and cambium layer toward the root, and is transmitted laterally inward by the medullary rays.

SAPINDACEÆ, soapworts; the typical order of *Sapindales*. Trees, shrubs, twining and with tendrils, rarely climbing herbs; leaves alternate, generally compound, sometimes dotted; flowers small, white or pink, rarely yellow. Found in S. America, in India, and various tropical countries; tribes, *Sapindeæ*, *Hippocastaneæ*, *Dodoneæ*, and *Melismeæ*. Known genera, 118; species, over 1,000.

SAPONIN, senegin; polygalin; a substance first observed in the common soapwort, but now found to be widely diffused through the vegetable kingdom. Quillaja bark, horse chestnuts, and senega root yield it in considerable quantities. The powdered substance is boiled in strong alcohol and filtered hot; the saponin separates in flocks on cooling and is purified by animal charcoal. It is a white friable powder, having a burning and persistently disagreeable taste, is more soluble in dilute than strong alcohol, and forms with water a frothy solution. It is often used to give an artificial froth to beer and effervescing beverages.

SAPONITE, an amorphous mineral occurring as nodules, or filling crevices, and forming amygdules in igneous rocks; soft, but brittle when dry; color, various; composition: essentially a hydrated silicate of magnesia and alumina. Also a clay resembling soap, occurring in the granite of the hot springs of Plombières, France.

SAPOR I., or **SHAHPUR**, a Persian king who reigned A. D. 240-272. He belonged to the dynasty of the Sassanidæ, which ruled Persia for about 400 years. Sapor's most noteworthy achievement was his successful war with the Romans, in which he defeated, took captive, and put to death the Emperor Valerian. (A. D. 260).

SAPPER, in military language, a term applied in England to officers and men of the Royal Engineers, who were originally organized as a corps of "Sappers and Miners." In the United States the work of the old sappers and miners is now done by the Engineer Corps.

SAPPHIRE, a gem excelled in value by no precious stone except the diamond, and regarded as a variety of corundum, highly transparent and brilliant. It is sometimes colorless or nearly so. It more frequently exhibits exquisite color, generally a bright red (*i. e.*, the ruby) or a beautiful blue—the latter being that commonly called sapphire. Purplish or greenish color indicates a flaw; and usual defects are clouds, milky spots, flakes, or stripes. It is found crystallized, usually in six-sided prisms, terminated by six-sided pyramids; it is sometimes found imbedded in gneiss, but more frequently occurs in alluvial soils. It occurs in Bohemia and Saxony, but European sapphires are of no commercial importance. The finest are found in Ceylon; Kashmir and Burma also produce fine specimens; and sapphires are found in Victoria, New South Wales, and parts of the United States. The value depends on quality more than on size, and does not increase with the size as does the ruby.

SAPPHO (saf'ō), a renowned Greek lyric poet; born in the island of Lesbos about 612 B. C. She wrote nine books of poems, but besides some small frag-

ments of her poems we have in complete form only a "Hymn to Aphrodite" and an "Ode to a Beautiful Girl."

SAPROPHYTIC PLANTS, plants that feed on decaying organic matter. In common with many of the PARASITIC PLANTS (*q. v.*), which are plants that live on or in and at the expense of other organisms, they are often devoid of chlorophyll. The reason of this peculiarity is obvious; chlorophyll being the material used by ordinary plants for the decomposition of the carbonic acid of the air in order that they may retain the carbon, and with it build up all the carbon compounds characteristic of organic nature, it is plain that those plants which obtain their carbon compounds ready-made up to a certain point do not require chlorophyll from which to manufacture them. If the saprophytism be not complete or "pure" there will be at least some chlorophyll remaining, as in the flowering axis of the orchid *Neottia*. Saprophytes may obtain their nourishment and especially their carbon compounds either from the remains of dead organisms or from organic compounds formed by living organisms. The Fungi that live on the bark of trees and the leaf-soil of forests and meadows (*e. g.*, mushrooms) are examples of the former case; those that feed on the juice of fruits and sugary solutions (*e. g.*, molds and yeasts) of the latter case.

Fungi may be physiologically classified as parasites and saprophytes; but this classification does not coincide with a morphological one. Further, there are certain species which lie between the two extremes, and these may be described as parasites which may become wholly or in part saprophytic through the whole course of their development or during certain stages of it; and also there are saprophytes which, with the same variations, may become parasitic.

The external conditions necessary for the commencement of germination of Fungi are the same as those needful to the germs and seeds of other plants; they are a certain temperature, a supply of oxygen and of water, in certain cases a supply of nutrient substances. The spores of the Perennosporeæ and of the Uredineæ germinate on drops of pure water; nutrient solutions may even be a hindrance. The Mucorini, on the other hand, emit only rudimentary germ tubes in pure water; they require a nutrient solution for germination. Most Fungi vary toward one extreme or other according to the species.

SAPSUCKER, the popular American name of several small woodpeckers.

SAPUCAIA NUTS, the seed of *Lecythis ollaria* and *L. zabucajo* trees, plentiful in the forests of the N. of Brazil, and belonging to the natural order *Lecythidaceæ*. The fruit is urn-shaped, as large as a child's head. Each fruit contains a number of seeds or nuts, as in the case of the allied Brazil nut, but the flavor is finer.

SAPULPA, a city of Oklahoma, the county-seat of Creek co. It is on the St. Louis and San Francisco railroad. It is an important industrial center, has railroad shops, large oil refineries, machine shops, glass, mattress, candy and other factories, and is the seat of an Indian mission school. Pop. (1910) 8,283; (1920) 11,634.

SARACEN, an Arabian or other Mussulman of the early and proselytizing period; a propagator of Mohammedanism in countries lying to the W. of Arabia. It was also applied to any infidel nation against which crusades were preached, such as the Turks.

SARAGOSSA (*Spanish*, Zaragoza), a very old city of Spain, the capital of the old kingdom of Aragon, now the capital of a province of the same name (area, 6,726 square miles; pop. about 500,000), on the Ebro (which separates the city from its suburbs), 176 miles N. E. from Madrid. Without being regularly fortified, it is surrounded by an earthen wall and is built throughout of bricks. The houses are seldom above three stories in height; the streets narrow and crooked, except one long and wide one called the Cozo. There are two bridges over the Ebro. The public buildings are numerous—churches, convents, and two cathedrals celebrated throughout Spain. The older one is much resorted to by pilgrims, as it contains a pillar on which the Virgin is said to have descended, and her image believed to have fallen from heaven. The city has a university, founded in 1474; also an academy of fine arts, and other educational institutions. It is a railroad center and its commerce and industries are of importance. It is noted in history for the memorable siege it sustained against the French, under Marshals Mortier and Lannes, and which lasted with slight intermission from July 15, 1808, to Feb. 21, 1809, when it finally surrendered, 54,000 of the inhabitants having died, meantime, chiefly of plague. Pop. (1918) 124,998.

SARASATE, PABLO MARTIN MELITON DE SARASATE Y NAVASCUES, Spanish violinist; born at Pamplona, March 10, 1844. He went to France as a child and entered the Paris Con-

servatoire in 1856. He became one of the greatest concert violinists of his time, and no violinist ever traveled more extensively. He composed for the violin romances, fantasias, and transcriptions of Spanish airs and dances. He died in Biarritz in 1908.

SARATOV, a city of Russia, on the Volga; 500 miles S. E. of Moscow. It is a city of broad streets and fine squares, and stands on terraces rising from the river. There are nearly 30 churches; a handsome new cathedral (1825), an old cathedral (1697), and Radistcheff's Museum, sheltering a fine art gallery and a library. Prior to the World War it had manufactures of brandy, liquors, flour, oil, and tobacco. Fishing was prosecuted in the river, and market gardening (especially fruit and the sunflower) in the vicinity. There was an important trade in corn, salt, iron, wooden wares, textiles, and groceries. The city was pillaged by Pugatcheff in 1774 and suffered severely from fire several times during the 19th century. Pop. about 235,500.

SARATOGA, BATTLES OF, in the Revolutionary War, two battles fought 12 miles E. of Saratoga Springs, N. Y. Burgoyne led the British in the first, while the Americans were under command of Gates, who had Morgan and Arnold as subordinates. The fight on Sept. 19, 1777, was indecisive. On Oct. 7, 1777, the Americans achieved a splendid victory over the British, the commanders of both armies being the same as in the first engagement. The result was the surrender of Burgoyne and his army, numbering 5,752 men, to the Americans, Oct. 17, 1777. These contests are sometimes called in history the battles of Stillwater and Bemis' Heights. The American victory came at a critical period of the Revolution. It frustrated the British plan for cutting off New England from the other states, enlisted the help of France, altered the policy of Parliament and the King and saved the cause of the patriots. Creasy enumerates it in his "Fifteen Decisive Battles of the World."

SARATOGA LAKE, a lake in Saratoga co., N. Y., 4 miles E. of Saratoga Springs. It is about 5 miles long and 2 miles wide.

SARATOGA SPRINGS, a village in Saratoga co., N. Y.; on the Boston and Maine and the Delaware and Hudson railroads; 38 miles N. of Albany. Besides being one of the most fashionable summer resorts in the world, Saratoga is visited by many persons for its medicinal advantages. Here are a large number of mineral springs, now owned by the State of New York, together with a reservation of some 350 acres; some of these are of great celebrity, the water being used not only for local consumption, but bottled in large quantities for exportation. The village contains over 30 hotels, some of great elegance and capable of accommodating more than 1,000 guests each. Here are a Convention Hall, Skidmore School of Arts, Athenæum, several private schools, hospital, armory, National banks, and daily, weekly, and monthly periodicals. There are manufactures of paper, furniture, machinery, etc. Pop. (1910) 12,693; (1920) 13,181.

SARAWAK, a state of Borneo, under British government, extending from Cape Datoo on the W. to the Samarahan river on the E. Area about 42,000 square miles. Coast line about 400 miles. The aboriginal inhabitants, called Dyaks, consist of various wild tribes who in 1844 took for their sovereign an Englishman, SIR JAMES BROOKE (*q. v.*), through whom the country is chiefly known. Pop. (1917) 600,000. Capital, Kuching.

SARCEY, FRANCISQUE (sar-sā'), a French author; born in Dourdan, France, Oct. 8, 1828. As dramatic critic for Paris journals he was highly esteemed for his independence of judgment and his wide acquaintance with dramatic literature. He published: "History of the Siege of Paris"; "The Word and the Thing," (1862); "Etienne Moret," (1875); "Recollections of Youth" (1884); "Recollections of Mature Age" (1892); "The Theater" (1893), etc. He died in Paris, May 16, 1899.

SARCINA, a plant of doubtful affinity, probably a fungus, consisting of minute quadrilateral bodies in fours, or some multiple of four. *S. ventriculi* was first observed by Goodsir in human vomit.

SARCOMA, plural **SARCOMATA**, cancerous growth, consisting of connective tissue cells retaining their embryonic condition. Those that remain in this elementary condition are round cells; those which advance one stage further are spindle-shaped; and a third kind originating in the bone, and having large nucleated myeloid cells, are called myeloid. The first is the most malignant.

SARCOPHAGUS, plural **SARCOPHAGI**, a kind of stone used among the Greeks for making coffins, and so called because it was believed to have the property of consuming the flesh of dead bodies deposited in it within a few weeks. It was also called "Assos stone," from

being found at Assos, a city of Lycia, in Asia Minor.

Hence a coffin or tomb of stone; a kind of stone chest used for containing a dead body.

SARD, a semi-precious stone of very compact variety of chalcedony presenting on a fractured surface a dull horn-like aspect; color, pale yellowish-red, shades of brown, transparent to translucent. It was much esteemed by the ancient gem engravers.

SARDANAPALUS, the name of several princes of Assyria, the most celebrated of whom was the last sovereign of the first Assyrian empire. His reign dates from 836 to 817 B. C., when he was dethroned by Arbaces and Belesis, at the head of a revolt of the Medes, Persians, and Babylonians. In the last extremity, Sardanapalus, who had withstood a siege for three years in Nineveh, placed himself, his treasures, his wives, and his eunuchs on a funeral pile, which he fired with his own hand. He had ceased to exist when the city was taken, and that event was followed by the dismemberment of the Assyrian empire. The above is a Greek legend (dates uncertain) of the reign of Asshur-banipal. See ASSYRIA.

SARDICA, anciently a town in Lower Dacia, on the site of the modern Bulgarian town of Sofia or Sophia. The town is chiefly celebrated as the place where an ecclesiastical council was held in 343, at which Athanasius defended himself against the Arians.

SARDINE, a name applied to several kinds of small fish of the family *Clupeidæ*, the true Mediterranean sardine. The fishing season begins early in June, and is now successful in places along the Atlantic coast and on Puget Sound. The coasts of Norway and Brittany, in France, are the scenes of the heaviest takes, and the grade of sardines obtained there is superior. As soon as the fishermen notice shoals of the porpoise or flocks of seagulls off shore sail is made immediately, for the sardine is there. In the United States an extensive industry is carried on, especially on the New England coast, in the way of preserving small fish which are sold under the name of sardines. True sardines having been discovered along the coast of California, in recent years, a large business has developed in canning the fish. In 1920 there were 16 factories engaged in this work.

SARDINIA, an island of Italy, after Sicily the largest in the Mediterranean; 135 miles W. of the mouth of the Tiber, and immediately S. of Corsica, being separated from it by the Strait of Bonifacio, 7½ miles wide. In shape it resembles an oblong set on end, with a deep wide bay, the Gulf of Cagliari, in the S., and another, the Gulf of Porto Torres, in the N. Area, 9,299 square miles. The surface is generally mountainous, the configuration that of a table-land running up into ranges and isolated peaks. The highest points occur along the E. side of the island, and reach 6,365 feet in Gennargentu in the center, and 4,468 in the mountains of Limbara in the N. The W. side of the island ranges at about 1,240 feet, though the extinct volcano of Monte Ferru reaches 3,400. The S. W. corner is separated from the main mass of the island by the low alluvial plain of Campidano, which stretches from the Gulf of Cagliari to the Gulf of Oristano, on the W. coast; at both extremities of it there are extensive salt lagoons.

Sardinia is in nearly all respects a backward island. It has fine natural resources—fertile soil, valuable mines, extensive forests, rich fisheries, and excellent facilities for manufacturing industry. But owing to the old-fashioned conservatism of the people, their apathy, their primitive methods of agriculture, lack of enterprise and capital, and want of means of communication, its resources have not been developed as they might be. Feudalism was not finally abolished in the island till 1856. Of the total area about one-third is arable land, one-third pasture, and nearly one-third (28 per cent.) forest. The principal produce is wheat, barley, beans, potatoes, wine, olive oil, oranges, lemons, tobacco, flax and hemp, cheese, butter, and wool. The breeding of horses is an important industry; and large numbers of cattle, sheep, swine, and goats are kept. There are over 4,000 industrial establishments employing about 34,000 persons. Tobacco and gunpowder made in large quantities are government monopolies.

Besides being in ancient times the granary of Rome, Sardinia was renowned for its mineral wealth. After lying unused from the fall of the Roman empire the mines were again worked by the Pisans in the 14th and 15th centuries; but work was not resumed in them with any degree of energy till toward the middle of the 19th century. Iron, copper, lead, zinc, antimony, manganese, and lignite exist. Granite, marble, and clay for pottery are quarried. Salt is manufactured from sea water. The center and N. of the island are chiefly covered with forests, though they are being all too rapidly diminished. The commonest as well as the most valuable trees are the oak,

ilex, cork, and wild olive, which yield timber, cork, bark for tanning, acorns, and charcoal.

The seas yield large quantities of tunny, sardines, anchovy, and coral, though the fisheries, except for tunny, are not prosecuted by Sardinians, but by Italians; the native fishermen prefer to catch trout, eels, lobsters, crabs, etc., in the rivers and inland lagoons. Sardinia has no extensive manufacturing industries, though there is some tanning and making of cigars, aërated waters, macaroni, flour, and spirits. There are, however, a variety of domestic industries for home use; most of the women still ply the spinning wheel. Till the year 1828 Sardinia had no roads for wheeled vehicles, the Roman roads having gone to ruin centuries ago. Now there are good roads throughout the island; and they are supplemented by railways.

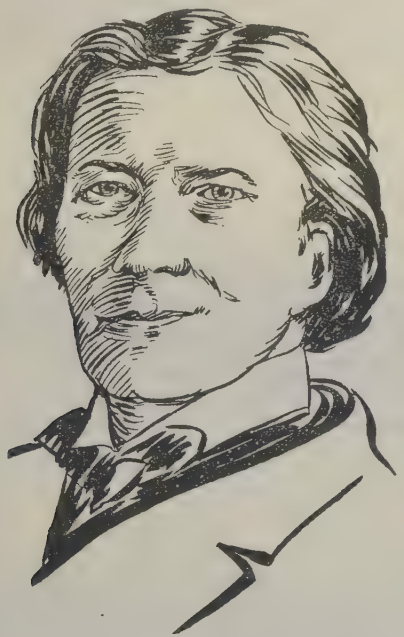
The island has numerous fairly good ports—Cagliari (the capital), Porto Torres, Terranova, Tortoli, Alghero, Carloforte, and Bosa—most of which have been improved by the construction of harbor works. The inhabitants are for the most part of mixed race, Spanish and Italian elements predominating. Pop. about 881,000. Education is in a very backward state, about 75 per cent of the population being unable to read and write. There are universities at Cagliari and Sassari. The practice of the vendetta and brigandage have now almost entirely ceased. The language is a mixture of Latin, Spanish, and Italian. The moufflon or wild sheep, with red deer, fallow deer, wild boar, and an abundance of smaller game, such as hares, partridges, woodcock, snipe, etc., are the creatures chiefly hunted. Administratively the island is divided into the two provinces of Cagliari and Sassari. There are three archbishoprics, Cagliari, Sassari, and Oristano, and eight bishoprics.

History.—The aboriginal inhabitants are believed to have been of Iberian stock, though this is by no means certain. They seem to have been conquered by the Phœnicians at an early period; but little authentic is known before the conquest by the Carthaginians in 512 B. C. For two centuries and a half this people bitterly oppressed the native inhabitants, so that when the Romans came in the 3d century they were hailed as deliverers. But the Sardinians did not at first bear the Roman yoke very patiently, though afterward, from the reign of Tiberius onward, they enjoyed 300 years of continuous peace and prospered greatly. After the fall of the Roman empire evil days again fell on the island; it was overrun by Vandals and Goths, and then for many years was incessantly harassed by the Saracens. During this time its nominal masters were the Byzantine emperors (till 774) and the Popes. In the beginning of the 11th century the Pisans and Genoese undertook the task of driving out the Saracens and holding the island against them; but they had a hard task for 20 years or more. Then, the Moslems beaten off, they took to quarreling with one another, and only agreed to divide the island between them in 1299, Genoa taking the N., Pisa the S. But the real internal government was in the hands of four "judges" or chiefs, each ruling a separate province; this arrangement existed several centuries before the Pisans came, and continued to exist for several centuries longer. The Pope, who still claimed the over-lordship, at this time gave Sardinia to the king of Aragon; and he made himself definitely master of it in 1416. The Aragonese and their sovereign successors, the Spaniards, kept possession of it till the treaty of Utrecht (1713); it then passed to Austria, but in 1718 was given to the House of Savoy in exchange for Sicily. United with Savoy and Piedmont, it gave title to a new kingdom, the kingdom of Sardinia. See SAVOY.

SARDIS, the capital of ancient Lydia in Asia Minor; stood at the N. foot of Mount Tmolus (5,906 feet), 2½ miles S. of Hermus. Through its market place flowed the Pactolus over sands rich in gold, an allusion in all probability to the wealth of the inhabitants, who wove woolen stuffs and carpets, and organized the traffic between the highlands of the interior and the coast; it was, moreover, the grand and luxurious capital of Crœsus, a monarch of fabulous wealth. In spite of the strength of its citadel it was destroyed by the Cimmerian Gauls in the 7th century B. C., by the Athenians in the 6th, by Antiochus the Great in 215 B. C., and by Timur in 1402; besides this it was overwhelmed by earthquakes in the reign of Tiberius. Both Xerxes and Cyrus the Great resided here before setting out on their great expeditions. As Byzantium rose to importance, Sardis lost the advantages of its situation on the great land route between Persia and Rome, and gradually declined. At the present day there is nothing left at its site, Sart, except a small village and ruin mounds.

SARDONYX, onyx consisting of alternate layers of sard and nearly opaque-white chalcedony. It is the most beautiful and the rarest variety of onyx, and that which was held in the greatest esteem by the ancients for engraving into cameos.

SARDOU, VICTORIEN, a French playwright; born at Paris, in 1831. He began his education as a student of medicine, abandoned medical studies for history and taught for a period during which he made his first dramatic ventures. Later he gave up teaching and became a professional writer and journalist. Financially unsuccessful and overtaken with ill health, he met with kindness and friendship from Mademoiselle Brécourt, who later became his wife,



VICTORIEN SARDOU

and, through her influence, was introduced to Mademoiselle Déjazet in 1859. Through the favor of this noted actress he achieved prominence rapidly; her popularity became the vehicle for his dramatic success and he produced a series of brilliant comedies based upon the social life of the day, among them "Les Pattes de Mouches" (1861, from Poe's "Purloined Letter"). This play was revived in New York in 1914 under the title of "A Scrap of Paper." As a dramatic author Sardou was keenly responsive to the social and political complexion of the day and the subjects of his plays were chosen to attract the attention of the moment. His journalistic capacity to recognize and fill the popular demand for drama of contemporary theme may be said to account for the enduring favor which he enjoyed before the public no less than his ability to produce drama of high literary merit. He entered the Academy in 1878. His later work was directed almost entirely toward sensational and spectacular productions in which the spoken parts were subordinated to scenic splendor and the entertainment of action. "Madame Sans-Gêne (1898), "La Sorcière" (1903), and "Divorçons" (1881), illustrate the quality and range of his gifts and also the tendencies toward artificiality which his later work possessed. In this direction his influence has been against the best dramatic standard. Among his many other plays are: "The Students' Inn" (1854); "Monsieur Garat" (1860); "Saint Gervais" (1860); "Piccolino" (1861); "The Butterfly" (1862); "The Black Devils" (1863); "Don Quixote" (1864); "The Benoîton Family" (1865); "The New House" (1866); "Seraphine" (1868); "Fernande" (1870); "Rabagas" (1872); "Uncle Sam" (1873); "Ferrèol" (1875); "Dora" (1877); "Daniel Rochat" (1880); "Odette" (1881); "Fédora" (1883); "Theodora" (1884); "Crocodile" (1886); "La Tosca" (1887); "Mama-in-law" (1889); "Cleopatra" (1890); "Thermidor" (1891); "Gismonda" (1894), etc. He died Nov. 8, 1908.

SARGASSO SEA, a name applied to large areas of the ocean covered with floating seaweed, *Sargassum bacciferum*. The best known Sargasso Sea lies in the North Atlantic Ocean, between the Azores and Antilles, its position being determined by the central whirl of the Gulf Stream. It was noticed by Columbus, who recorded on his first voyage of discovery (1492) that his whole course was through masses of these weeds, from Sept. 16 to Oct. 12. There is a smaller Sargasso Sea off the coast of Lower California, in the Pacific Ocean. Another lies between Australia and the Falkland Islands in the Antarctic waters.

SARGASSUM, a genus of *Algæ*. *S. bacciferum* is the gulf-weed of the Atlantic. Its stems are much employed in South America, under the name of goitre-sticks, in the treatment of goitre. Their beneficial effects are due to the large proportion of iodine existing in the plant.

SARGENT, CHARLES SPRAGUE, an American arboriculturist, born in Boston in 1841. He graduated from Harvard in 1862. He served during the Civil War, and in 1872 became professor of horticulture at the Arnold Arboretum in Boston. In 1873 he was director of the arboretum, and from 1879 was professor of arboriculture at Harvard. He was chairman of the commission for the preservation of the Adirondack forests, in 1885, and also acted as chairman of

the commission appointed by the National Academy of Sciences for the establishment of a forest policy for the United States. He was an officer and member of many foreign and American societies and wrote: "The Woods of the United States"; "The Forest Flora of Japan"; "Manual of the Trees of North America" (1905); and many reports.

SARGENT, DUDLEY ALLEN, an American physical director, born at Belfast, Me., in 1849. He graduated from Bowdoin College in 1875 and from the medical department of Yale in 1878. From 1879 he was director of the Hemenway Gymnasium at Harvard. From 1881 to 1916 he was director of the Normal School of Physical Training, Cambridge, Mass., and from the latter year was president of the Sargent School for Physical Education. He was the inventor of many pieces of modern gymnasium apparatus. He wrote "Health, Strength and Power" (1904).

SARGENT, EPES, an American author; born in Gloucester, Mass., Sept. 27, 1813. His works include: "Change Makes Change," a comedy; "The Priestess," a tragedy; "Wealth and Worth" (1840), a novel; "Peculiar: A Tale of the Great Transition" (1863); "Life of Henry Clay." "Songs of the Sea" and "A Life on the Ocean Wave" are the most popular of his verses. His "Cyclopædia of English and American Poetry" was published in 1883. He died in Boston, Dec. 31, 1880.

SARGENT, JOHN SINGER, an American artist; born in Florence, Italy, in 1856; studied art under Carolus Duran; received a second-class medal at the Paris Salon in 1881; took a medal of honor at the Paris Exposition in 1889; and was elected an academician of the Royal Academy, England, in 1897, and of the National Academy of Design in New York in 1897. His works include the figure pieces: "Fishing for Oysters at Cancale"; "Neapolitan Children Bathing," and "El Jaleso"; the portraits: "Doctor Pozzi"; "Portrait of a Young Lady"; "Madam G."; "Henry Marquand"; and numerous sketches, ideal figures, etc., portraits of Theodore Roosevelt, and other eminent Americans. His mural decorations are notable, especially those in the Public Library of Boston. He was a member of the American Academy of Arts and Letters.

SARK, or **SERCQ**, one of the Channel Islands, situated about 6 miles from Guernsey. It is divided into Great Sark and Little Sark, the connection between these being a narrow neck of land called Coupée; length about 5, and breadth about 3 miles. The island is surrounded by almost inaccessible rocks, and the carriage roads are steep. Fishing is the chief employment; and the manufactures are principally stockings, gloves, etc.

SARMATIA, a name given by the Romans to all the country in Europe and Asia between the Vistula and the Caspian Sea. The people inhabiting this country were usually called Sauromatæ by the Greeks, and Sarmatæ by the Romans. The Sarmatians began to threaten the Roman empire in the reign of Nero (54-68). Since that time they figure promiscuously among the barbarians who vexed the N. E. frontier of the Roman empire. They were finally subdued by the Goths, with whom, in process of time, they were amalgamated.

SARMATIANS, a people of supposed Asiatic race, who in the time of the Romans occupied the vast region between the Black, Baltic, and Caspian Seas. They were a nomadic race, whose women went to war like the men, and they were said by tradition to be descended from the Amazons by Scythian fathers. Sarmatia coincided in part with Scythia, but whether the people were of the same race is doubtful.

SARONIC GULF (*Sinus Saronicus*), the ancient name of the Gulf of Ægina, on the E. coast of Greece.

SAROS, an ancient Assyrian astronomical period, the origin and exact length of which are unknown, though they have been the subject of much disputation. By some authors the saros has been confounded with the Metonic cycle.

SARPI, PAOLO (surnamed SERVITA), better known by his monastic appellation, FRA PAOLO; an Italian historian; born in Venice Aug. 14, 1552, embraced the monastic life, and took the vows in the religious order of the Servites in 1565. Five years later the Duke of Mantua made him his court theologian; but he was soon after summoned to be Professor of Philosophy in the Servite monastery at Venice, and there he remained all the rest of his life. For nine years, however (1579-1588), he was absent in Rome looking after affairs connected with the reform of the Servite order. In the dispute between the republic of Venice and Paul V. on the subject of clerical immunities Sarpi stepped forward as the valiant champion of the republic and of freedom of thought. On the repeal (1607) of the edict of excommunication launched against Venice, Sarpi was summoned to Rome to account for his conduct. He refused to obey, and

was excommunicated as contumacious; and an attempt was made on his life by a band of assassins. He afterward confined himself within his monastery, where he wrote "History of the Council of Trent," a "History of the Interdict," and other works. The first named was published in London in 1619 under the pseudonym of Pietro Soave Polano, an anagram of Paolo Sarpi Veneto; and it almost immediately rose into popularity with the adversaries of Rome, as well in England as throughout the continent. He died Jan. 15, 1623.

SARPLAR, a large sack or bale of wool containing 80 tods; a tod contains 2 stone of 14 pounds each.

SARRACENIACEÆ, in botany, the pitcher plants; an order of hypogynous exogens, alliance Ranales; herbaceous, perennial bog plants. Known genera two, species seven; mostly North American; one is from Guiana.

SARRAIL, MAURICE, a French general, the commander of the Sixth Army Corps at the outbreak of the World War. When hostilities began he was sent to the Argonne, where he organized the defense of Verdun, during the first

GENERAL SARRAIL

attacks made by the army of the German Crown Prince at this point, during August and September, 1914. In August, 1915, General Sarrail was sent to take command of the Allied army in Macedonia, with headquarters in Salonika. It was while under his command that the Allied forces in this region took from the Bulgarians the important city of Monastir, in December, 1915. In December, 1917, General Sarrail was recalled and returned to France.

SARRE (*German*, Saar), a river rising in the Vosges mountains and after flowing northwest, emptying into the Moselle, a few miles above Treves. Of its entire length of 152 miles, about 54 miles are navigable to Sarrebruck and about 20 miles more to Sarreguemines by means of a system of locks. The middle course of the river is connected with the Rhine-Marne canal through the Sarre canal. The valley of the Sarre is famous for its wines. The adjacent territory contains extremely rich coal deposits. The river formerly was in German territory, but as a result of the Peace Treaty of Versailles, all of it, with the exception of the last 20 miles, is now under French control. See SARRE BASIN.

SARRE (*German*, Saar) **BASIN**, a coal mining region on both sides of the Sarre river, forming part of the Prussian province of Rhenish Prussia and of the Bavarian Palatinate. Its area is approximately 751 square miles and it has a population of 657,870. The more important towns are Forbach, Sarrebruck, St. Ingbert, Sulzbach, Neunkirchen, Puttlingen, and Sarrelouis. The region is of great industrial importance on account of its rich coal mines. The political importance of the district is due primarily to the provisions regarding it contained in the Versailles Peace Treaty. In payment for the destruction of coal mines in northern France and as payment on account of reparations, Germany ceded the mines to France, the territory to be governed by a commission for fifteen years. For the provisions of the treaty see TREATIES OF VERSAILLES AND ST. GERMAIN ("The Sarre").

SARREGUEMINES, (German Saargemünd), a town in Alsace-Lorraine, at the confluence of the Blies and the Sarre. It is 40 miles E. of Metz, and 60 miles N. W. of Strasbourg. It is noted for manufactures of plush, leather, velvet, porcelain, faïence, and papier-mache snuff-boxes. Sarreguemines was originally a Roman settlement. Ceded to the Duke of Lorraine by the Count of Saarbrücken in 1297, it went to France in 1766, returned to Germany in 1871, and became French again with Alsace-Lorraine under the Versailles Treaty in 1919. Pop. about 15,000.

SARRETTE, BERNARD, founder of the Conservatoire de Musique of Paris, was born in Bordeaux, Nov. 27, 1765. At the commencement of the Revolution he became an officer of the Garde Nationale. After the fall of the Bastille, July 14, 1789, he gathered together forty-five

musicians and created a corps de musique for the Garde. The municipality of Paris increased the body, and then authorized Sarrette to establish a free school, which became the Institut National de Musique, and finally the Conservatoire. Sarrette was for a time director, but for some reason, which is not quite clear, he was imprisoned for a month and a half, just before Robespierre's triumph. He never again resumed his functions, and he died in retirement at Paris, April 11, 1858.

SARRIEN, JEAN-MARIE-FERDINAND, a French statesman, was born at Bourbon-Lancy, Saône-et-Loire, in 1846. He gave up the practice of law to fight against Germany in 1870. In 1876 he was elected to the Chamber of Deputies, and held portfolios in the cabinets of Brisson, Freycinet, and Tirard from 1885 to 1888. In 1889 he was minister of justice under Brisson. After the fall of Rouvier through disturbances connected with the operation of the Church Separation Act, he became premier and minister of justice March 14, 1906, but the real power in the cabinet (the so-called "ministry of all the talents") was CLEMENCEAU (*q. v.*). Sarrien retired in October, 1906.

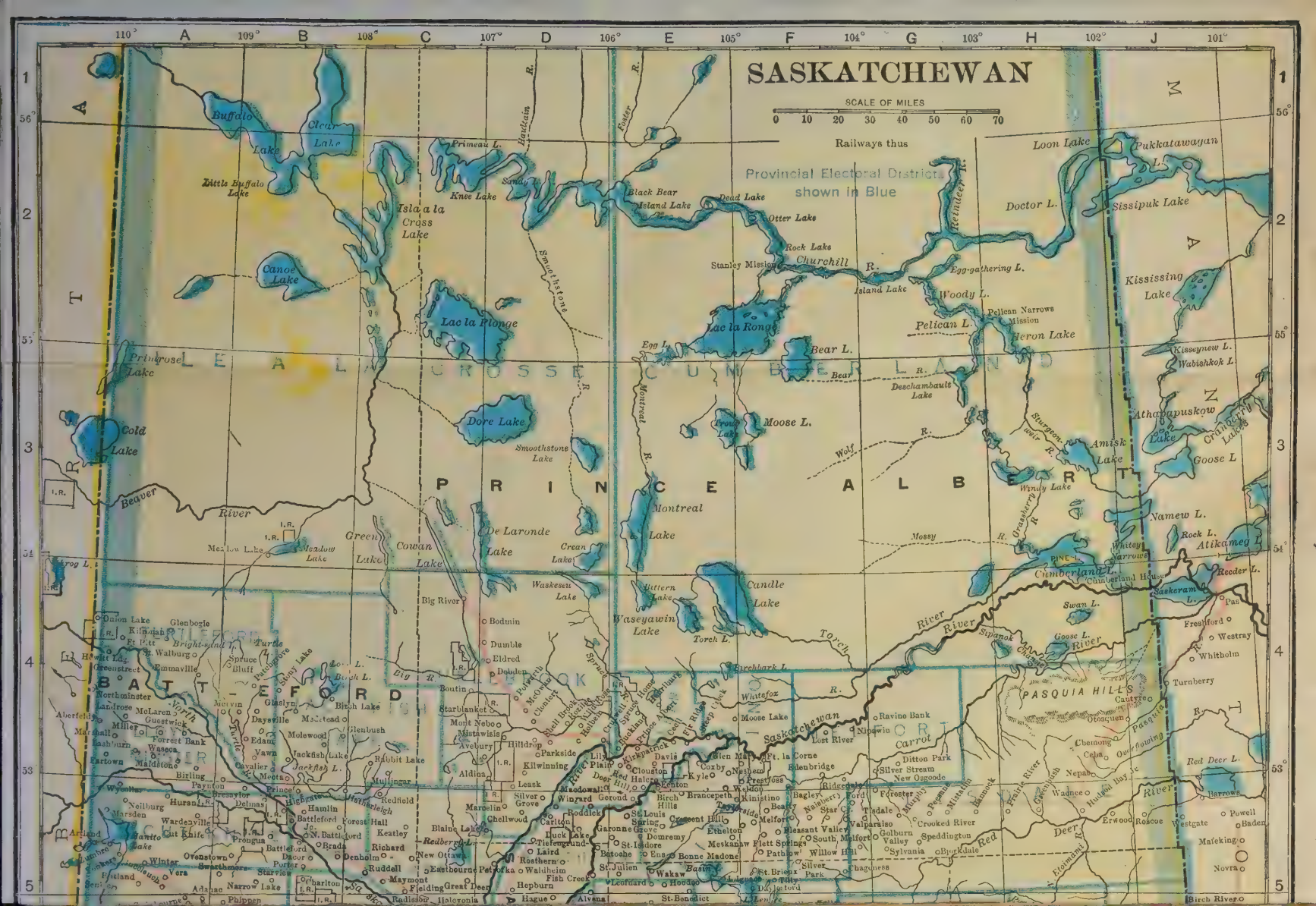
SARRUSOPHONE, a form of wind instrument of the horn class. They are made *en suite*, of sizes and compass to take different parts in concerted pieces of music, and are known as the cornets and saxhorns by names, as soprano, contralto, tenor, baritone, bass, etc.; by the pitch, as B flat, E flat, etc.

SARSAPARILLA, name of an order of dictyogens, the *Smilaceæ*. In pharmacy, the rhizome of *Smilax officinalis*, a native of Central America. The rhizome of sarsaparilla is popularly called the chump; one with roots and rootlets, the latter finely subdivided, is said to be bearded. Sarsaparilla is supposed to be diaphoretic, diuretic, demulcent, tonic, and alterative. It has been given with other medicines in syphilis, scrofula, etc. Also, the sarsaparilla of Vera Cruz, *Smilax medica*, that of Peru *S. purhampuy*, that of Lisbon and Brazil *S. siphilitica*, that of Australia *S. glycyphylla*. Many Asiatic species of smilax, as *S. zeylonica*, *S. glabra*, *S. perfoliata*, *S. leucophylla*, and *S. china*, and *S. aspera* and *S. excelsa* from the S. of Europe—the last two sometimes called Italian sarsaparilla—furnish inferior qualities of the drug. The name is also applied to the *Aralia nudicaulis*, which grows wild in the United States and Canada.

SARTAIN, JOHN, an American artist; born in London, England, Oct. 24, 1808; came to the United States in 1830, and was one of the first to introduce mezzotint engraving. In 1843 he became proprietor and editor of "Campbell's Foreign Semi-Monthly Magazine," and thereafter devoted himself to engraving and literary work. In 1848 he purchased a half interest in the "Union Magazine," afterward called "Sartain's Union Magazine," which he edited and illustrated during the four years of its existence. Subsequently he held various offices, in the Artists' Fund Society, the School of Design for Women, and the Pennsylvania Academy; was elected a member of the Society Artis et Amicitiæ in Amsterdam, Holland, in 1862, and in 1876 had charge of the art department at the Philadelphia Centennial Exposition. He was the author of a large number of engravings for book illustration, and engraved many historical paintings, including Rothermel's "Battle of Gettysburg" and "The Iron Worker and King Solomon"; designed the monument to Washington and Lafayette in Monument Cemetery, Philadelphia; and published interesting personal reminiscences. He died in Philadelphia, Pa., Oct. 25, 1897.

SARTHE, a department of France, N. of the Loire; formed out of the old provinces of Anjou and Maine; area, 2,411 square miles. The Sarthe flows S. through the department, and the Loire W. along the S. border. The department is fairly level and the soil fertile. Essentially an agricultural department, it produces wheat, oats, barley, and potatoes, sends its geese, chickens, eggs, cattle and swine to Paris, is famous for its breed of horses and for its wine and cider. Coal is mined, and there are manufactures of hemp, linen, and cotton textiles, paper, glass, leather, machinery, etc. Capital, Le Mans. Pop. 420,000.

SARTI, GIUSEPPE, an Italian music composer; born in Faenza, Italy, Dec. 28, 1729. He held the office of organist to the cathedral of Faenza from 1748 to 1750. The success of two operas, "Pompey in Armenia" (1751) and "The Shepherd King" (1753), brought him a royal invitation to Copenhagen in 1753; and there he remained till 1775. After his return to Italy he was successively director of the conservatory at Venice (till 1779) and chapel master of Milan cathedral; in this last post Cherubini was his pupil and assistant. During this period he composed some of his most successful operas: "Rustic Jealousies" (1775); "Giulio Sabino" (1781); "The Marriage of Dorina" (1782); and others. In 1784 Catharine II. invited him to St. Petersburg. On his way he made the acquaintance of Mozart at Vienna. His most notable productions while in Russia were


SASKATCHEWAN
SCALE OF MILES
0 10 20 30 40 50 60 70
Railways thus
Provincial Electoral Districts shown in Blue
110° A 109° B 108° C 107° D 106° E 105° F 104° G 103° H 102° J 101°
56° 55° 54° 53° 52° 51°
ALBERTA
MANITOBA
Buffalo Lake
Clear Lake
Little Buffalo Lake
Primeau L.
Sandy L.
Knee Lake
Isla a la Crosse Lake
Canoe Lake
Lac la Plonge
Primrose Lake
Cold Lake
Beaver River
Dore Lake
Smoothstone Lake
Meadow Lake
Green Lake
Cowan Lake
De Laronde Lake
Crean Lake
Waskesiu Lake
Big River
Bodmin
Dunble
Eldred
Debden
Boutin
Starblanket
Mont Nebo
Mistawisis
Hilldrop
Parkside
Kilwinning
Aldina
Leask
Meadow Lake
Winward
Gerond
Silver Grove
Roddick
Carlton
Chellwood
Marcelin
Redfield
Hamlin
Battleford
Forest Hall
Keatley
Prongua
Battleford
Brada
Richard
Denholm
Ruddell
Dacor
Porter
Eastbourne
Petrofka
Maymont
Fielding
Great Deer
Hepburn
Hague
Radisson
Halcyonia
Alvena
St. Benedict
Leoffard
Hoodoo
Waskaw
Basin
Fish Creek
Waldheim
Rosthern
Laird
Aberdeen
Hepburn
Duck Lake
Tiefengrund
St. Isidore
Batoche
Bonne Madone
Meskanaw
Flett Springs
Pathlow
Willow Hill
Silver Park
Chagoness
St. Brieux
Domremy
Ethelton
Melfort
Star City
Tisdale
Valparaiso
Golburn
Sylvania
Crooked River
Speddington
Bjorkdale
Pleasant Valley
South Melfort
Carrot River
Nipawin
Ravine Bank
Lost River
Saskatchewan River
Whitefox
Moose Lake
Torch River
Torch L.
Waseyawin Lake
Pittern Lake
Candle Lake
Birchbark L.
Cumberland L.
Cumberland House
Pine
Swan L.
Goose L.
Sipanok Creek
Pasquia Hills
Cantyre
Otosquen
Chemong
Ceba
Nepabe
Hudson Bay
Red Deer L.
Red Deer River
Wadnee
Harrows
Erwood
Roscoe
Westgate
Powell
Baden
Mafeking
Novra
Birch River
Turnberry
Fredford
Westray
Whitholm
Pas
Reader L.
Saskeram L.
Namew L.
Rock L.
Atikameg
Goose L
Amisk Lake
Athapapuskow Lake
Cranberry Lakes
Kississing Lake
Wabishkok L.
Kissaynew L.
Pelican Narrows Mission
Pelican L.
Heron Lake
Woody L.
Egg-gathering L.
Island Lake
Churchill R.
Rock Lake
Stanley Mission
Otter Lake
Dead Lake
Black Bear Island Lake
Deschambault Lake
Bear L.
Bear R.
Egg L.
Lac la Ronge
Moose L.
Frotet Lake
Montreal Lake
Montreal R.
Wolf R.
Sturgeon-weir R.
Windy Lake
Mossy R.
Whitey Narrows
Loon Lake
Pukkatawayan
Doctor L.
Sissipuk Lake
Reindeer R.
Foster R.
Hanbain R.
Smoothstone R.
Sandy R.
Meadow Lake
Frog L.
Big R.
Spruce R.
Turtle R.
Spruce Bluff
Paddymore
Smoky Lake
Beech L.
Big L.
Birch Lake
Mervin
Glaslyn
Dayerville
Maidstead
Blenbush
Molewood
Jackfish L.
Rabbit Lake
Mullingar
Meota
Cavalier
Edam
Vawn
Waseca
Maidstone
Birling
Paynton
Prince
Wyatt
Neilburg
Hurstan
Delmas
Marsden
Wardenville
Cut Knife
Ardlund
Manito Lake
Dumbarton
Lashburn
Marshall
Miller
Aberfeld
Northminster
Landrose
McLaren
Guernsey
Forrest Bank
Wasaca
Eartown
Wyndham
Highgate
Redberry L.
Blaine Lake
Battleford
Battleford
Onion Lake
Glenbogie
Kilmuir
Ft. Pitt
Bright-sand L.
Walburg
Emmaville
Greenstreet
Spruce Bluff
Turtle R.
Paddymore
Smoky Lake
Beech L.
Big R.
Boutin
Starblanket
Mont Nebo
Mistawisis
Hilldrop
Parkside
Kilwinning
Aldina
Leask
Meadow Lake
Winward
Gerond
Silver Grove
Roddick
Carlton
Chellwood
Marcelin
Redfield
Hamlin
Battleford
Forest Hall
Keatley
Prongua
Battleford
Brada
Richard
Denholm
Ruddell
Dacor
Porter
Eastbourne
Petrofka
Maymont
Fielding
Great Deer
Hepburn
Hague
Radisson
Halcyonia
Alvena
St. Benedict
Leoffard
Hoodoo
Waskaw
Basin
Fish Creek
Waldheim
Rosthern
Laird
Aberdeen
Hepburn
Duck Lake
Tiefengrund
St. Isidore
Batoche
Bonne Madone
Meskanaw
Flett Springs
Pathlow
Willow Hill
Silver Park
Chagoness
St. Brieux
Domremy
Ethelton
Melfort
Star City
Tisdale
Valparaiso
Golburn
Sylvania
Crooked River
Speddington
Bjorkdale
Pleasant Valley
South Melfort
Carrot River
Nipawin
Ravine Bank
Lost River
Saskatchewan River
Whitefox
Moose Lake
Torch River
Torch L.
Waseyawin Lake
Pittern Lake
Candle Lake
Birchbark L.
Cumberland L.
Cumberland House
Pine
Swan L.
Goose L.
Sipanok Creek
Pasquia Hills
Cantyre
Otosquen
Chemong
Ceba
Nepabe
Hudson Bay
Red Deer L.
Red Deer River
Wadnee
Harrows
Erwood
Roscoe
Westgate
Powell
Baden
Mafeking
Novra
Birch River
Turnberry
Fredford
Westray
Whitholm
Pas
Reader L.
Saskeram L.
Namew L.
Rock L.
Atikameg
Goose L
Amisk Lake
Athapapuskow Lake
Cranberry Lakes
Kississing Lake
Wabishkok L.
Kissaynew L.
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Frotet Lake
Montreal Lake
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Mossy R.
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Hanbain R.
Smoothstone R.
Sandy R.
Primeau L.
Isla a la Crosse Lake
Knee Lake
Little Buffalo Lake
Buffalo Lake
Clear Lake
Canoe Lake
Lac la Plonge
Primrose Lake
Cold Lake
Beaver River
Dore Lake
Smoothstone Lake
Meadow Lake
Green Lake
Cowan Lake
De Laronde Lake
Crean Lake
Waskesiu Lake
Big River
Bodmin
Dunble
Eldred
Debden

MANITOBA
SASKATCHEWAN
ALBERTA
UNITED STATES
Longitude West from Greenwich
109°
108°
107°
106°
105°
104°
103°
102°
HUM'BOLDT
MACKENZIE
KERRY
HANLEY
MARIPOSA
HAPPY LAND
MOOSE JAW
REGINA
QUAPPELLE
LAKE
MAPLE CREEK
CYPRESS
WOOD MOUNTAIN
ZASTRUZNIBO
Lake Johnston
Wood Mountain
Big Muddy
Frenchman
Milk
Missouri
Assiniboine
Qu'Appelle
Souris
Saskatchewan
Moose Jaw
Pasqua
Wascana
Pelican L.
Chaplin
Old Wives
Crane L.
Bigstick Lake
White Bear L.
Twelve-mile L.
Willowbunch
Life L.
Big Muddy
Lake
Regina
Weyburn
Estevan
Moosomin
Yorkton
Melville
Indian Head
Broadview
Swift Current
Maple Creek
Shaunavon
Gravelbourg
Assiniboia
Moose Jaw
Mortlach
Caron
Belle Plaine
Pilot Butte
Balgonie
Lumsden
Craven
Strasbourg
Qu'Appelle
Fort Qu'Appelle
Lebret
Katepwa
Indian Head
Grenfell
Wolseley
Whitewood
Broadview
Wapella
Sintaluta
Moosomin
Kipling
Langbank
Rocanville
Esterhazy
Stockholm
Hazelcliffe
Tantallon
Welby
Gerald
Yarbo
Marchwell
Langenburg
Bredenbury
Churchbridge
Kamsack
Veregin
Canora
Norquay
Pelly
Arran
Benito
Kenville
Bowsman
Birch River
Swan River
Mackenzie
Shell
Madge
Deepdale
Makaroff
Togo
Rhineymede
Cote
Kelvington
Nut Mountain
Usherville
Woodhaven
Arabella
Whitebeech
Danbury
Strand
Eastwood
Sturgis
Neeyim
Hyas
Preeceville
Hazel Lake
Elfros
Buchanan
Tiby
Tuffnel
Netherton
Mikado
Canora
Veregin
Kamsack
Cote
Rhineymede
Togo
Makaroff
Deepdale
Sturnoway
Shillingthrope
Zorra
Wroxton
Lloyd
Pennock
Bercaina
Crescent Lake
Peoples
Goodeve
Kelliher
Leross
Garnock
Jasmin
Ithna
Rock Dell
Jedburgh
Willowbrook
Enfin
Otthon
Clonmel
Saltcoats
MacNutt
Pennock
Bercaina
Crescent Lake
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Frontier
Gull Lake
Cabri
Herbert
Morse
Eastend
Wood Mountain
Big Muddy
Lake
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Weyburn
Estevan
Moosomin
Yorkton
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Broadview
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Gravelbourg
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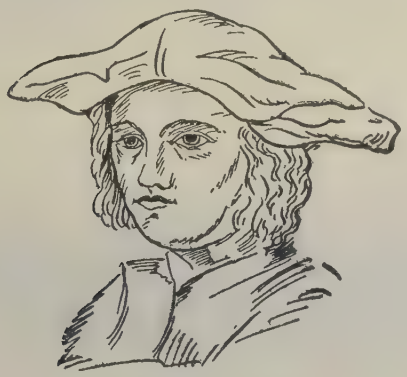
Wood Mountain
Big Muddy
Lake

the opera "Armida" (1786) and a "Te Deum." He died in Berlin, July 28, 1802.

SARTO, ANDREA DEL, one of the most distinguished painters of the 16th century; born near Florence, Italy, July 16, 1487. His proper name was Andrea Vanucchi, the appellation del Sarto (of the Tailor) being applied to him from the occupation of his father. He painted many frescoes in his native city, and Francis I. induced him to go to France in 1518. He soon returned to Italy, and having appropriated large sums



ANDREA DEL SARTO

which had been given him by his royal patron to purchase the pictures of great masters in Italy, he could not go back to France. Among his most important easel pictures are the "Sacrifice of Abraham" and the "Marriage of St. Catherine," in the gallery of Dresden; "The Madonna di San Francesco," an "Annunciation," and an "Assumption of the Virgin," at Florence; a "Deposition" from the Cross; a portrait of himself and "Virgin and Child with St. Joseph." He is best known in galleries by his "Holy Families." He died of the plague in Florence, Jan. 22, 1531.

SARTORITE, an orthorhombic mineral, occurring only in crystals in cavities in the dolomite rock of the Binn valley, Switzerland.

SARUM, an important settlement of the early Britons, in Wiltshire, about a mile and a half N. of Salisbury, then a Roman station, and afterward the residence of the West Saxon kings till England became one kingdom. Till the time of Henry III. it was an important city, but it is now chiefly known for the privilege it enjoyed for more than 500 years of sending two members to Parliament after it had ceased to be inhabited. It headed the list of "rotten boroughs," and was disfranchised by the Reform Act of 1832.

SASIN, the common Indian antelope, *Antilope bezoartica* (or *cervicapra*): female destitute of horns, those of the male spiral, wrinkled at the base, annulated in the middle and smooth at the tip; adult males dark above, white beneath, the nose, lips, and a circle round each eye white; brushes of hair on the knees; females and young males under three years old tawny above, white beneath, with a light silvery band along the sides.

SASKATCHEWAN, a province of Canada which receives its name from the Saskatchewan river, which flows through the northern part. It comprises the former territorial districts of Assiniboya East, Assiniboya West, Saskatchewan, and the eastern portion of Athabaska. Prior to Sept. 1, 1905, it was a part of the Northwest Territories. From that date it became a separate province. It has an area of 251,700 square miles. In 1921 the population was 761,390. The area of the arable land is estimated at 57,884,160 acres.

Production and Industry.—Saskatchewan is the largest wheat producing country in the world, growing between 117,000,000 and 118,000,000 bushels annually. The estimated acreage of wheat in 1919 was 10,587,363, of oats 4,837,747, of barley 492,596, of flax 929,945. The value of the entire grain crop in 1919 was $305,613,961. The total production of grain in the same year was 210,529,016 bushels. The chief mineral product is coal. There were in 1919 over 50 coal mines in operation, producing about 400,000 tons. The estimated coal resources of the Province are 59,812,000,000 metric tons. There were in 1917 1,436 manufacturing establishments, employing 7,097 persons. The value of the product was $40,657,746. In 1918-19 the total imports were valued at $17,388,037, and the exports at $20,707,513. There were 587 bank branches in the Province in 1919. There are about 125,000 pupils in the elementary schools and about 4,000 in the high schools. Since 1905 the government has spent over $13,000,000 for educational purposes. There are over 6,000 miles of railway, a longer mileage than any other Canadian province except Ontario. Lumbering is one of the principal industries. The value of the product in 1918 was $2,122,307. The chief cities are Regina, 40,000; Saskatoon, 30,000; Moose Jaw, 22,000; and Prince Albert, 6,500. The provincial government is vested in a Lieutenant-Governor and a Legislative Assembly of 62 members, elected for five years. Women were given the franchise in 1916.

SASKATCHEWAN, a river of the Northwest Territories, Canada, formed by two main streams, the South Saskatchewan or South Branch (called also the Bow river) and the North Saskatchewan or North Branch. The sources of these two streams are very near each other on the E. slope of the Rocky mountains. The South Branch flows S. E. to its junction with the Belly river, then N. E. to its junction with the North Branch. The North Branch flows N. past Mount Murchison, through Kutanie plain, then E. to its confluence with the South Branch. The course of the North Branch is about 836 miles, and of the South Branch, 903 miles. From their junction the river course is through the desert bed of Lake Agassiz, then E. to its mouth in Lake Winnipeg. The total length is about 1,200 miles. From its mouth it is navigable, by the North Branch, about 800 miles. The river is narrow in the greater part of its course.

SASKATOON, a city of Canada, the capital of Saskatoon District, on the South Saskatchewan river and on the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific railways. It is a port of entry and the wholesale distributing, commercial, financial and educational center for central and western Saskatchewan. Its institutions include the University of Saskatchewan, an agricultural college and experimental farm, and a normal school. Its industries include planing mills, iron foundries, cold storage plants, etc. It has a custom house, two hospitals, a court house, and an opera house. Pop. about 30,000.

SASSAFRAS, in botany: (1) a genus of *Lauraceæ;* dicœcious, perianth six-parted males with nine fertile stamens in three rows, anthers four-celled; females with nine sterile stamens; fruit fleshy. *S. officinale* (*Laurus sassafras*) is a large tree with yellowish flowers, growing in the United States. The dried leaves are very mucilaginous and are sometimes used for thickening soup. *S. parthenoxylon,* Oriental sassafras, growing in Sumatra, has medicinal qualities like those of *S. officinale.* (2) The English name of the genus, and of various trees more or less resembling it in properties, specifically, *Doryphora sassafras,* one of the plume nutmegs. The wood smells like fennel. (*Australian.*) Brazilian sassafras is *Nectandra cymbarum.* In pharmacy, the dried root of *Sassafras officinale.* It is sold in branches, in pieces, or in chips, and is given as a stimulant and diaphoretic in chronic rheumatism, skin diseases, and syphilis. The bark is more powerful than the wood.

SASSAFRAS OIL, an oil obtained from root-bark of *Lauras sassafras.* It has the odor of fennel, a slight yellow color and an acrid taste, sp. gr.=1.09, and is a mixture of at least two substances, a liquid oil and a solid camphor ($C_{10}H_{10}O_2$).

SASSANIDÆ, a Persian dynasty of kings, which succeeded the Parthian dynasty of the Arsacidæ, and reigned from A. D. 226 until A. D. 652. The dynasty began with Ardishir Babigan, and owes its name to the grandfather of that prince, named Sassan.

SASSARI, a city of Sardinia, ranking next after the capital, Cagliari; 12 miles from the Gulf of Asinara, where its port, Porto Torres, is situated, and 162 miles N. by W. of Cagliari. A prosperous-looking town, with both old and new houses, embosomed in orange and olive groves, it has a cathedral (1531), an old castle (1327–1331), a university (1677, reopened in 1766) with about 120 students, a museum of Roman antiquities, a natural history collection, and a library (1556) of over 25,000 volumes, and is the seat of an archbishop and of several of the old Sardinian nobles. There is a busy trade in grain, olive oil, cheese, and hides. Pop. about 43,000.

SASSOON, SIR PHILIP (Albert Gustave David), a British public official. He was born in 1888, and after leaving school entered the British army, becoming lieutenant in the Royal East Kent Yeomanry. In 1912 he was elected to represent the Hythe Division of Kent as a Unionist in the House of Commons and has held the seat since that time. During the war he acted as private secretary to Field Marshal Sir Douglas Haig, Commander-in-Chief of the British Armies in France. He is a Chevalier of the Legion of Honor and Officer of the Order of the Crown of Belgium.

SATAN. See DEVIL.

SATELLITE, a subordinate attendant; an obsequious or subservient follower. Hence, in astronomy, a secondary planet revolving around a primary one. The moon is satellite to the earth. Mars has two satellites, Jupiter five, Saturn ten, Uranus four, and Neptune one.

SATIN, a silken fabric with an overshot woof and a highly finished surface. The woof is coarse, and hidden underneath the warp, which forms the surface. The warp is of organzine, the weft of tram. In a full satin twill there is an interval of 15 threads.

SATINET, a light kind of satin; also a glossy cloth made of a cotton warp and woolen filling, to imitate satin.

SATIN WOOD, an ornamental cabinet-wood from the West and East Indies. The former is the better kind, and is chiefly derived from *Ferolia guianesis*. That from the East Indies is less white, and is produced by *Chloroxylon swietenia*, which also yields wood oil.

SATIRE, keenness and severity of remark; sarcasm; trenchant wit; biting ridicule; incisive humor; pungent irony; denunciation and exposure to derision or reprobation. In literature, the representation of follies or vices in a ridiculous form, either in discourse or dramatic action. The Romans were the first to distinguish themselves in this species of literature. Horace is the great master in this art, whose humorous and playful raillery of the follies and foibles of mankind are ever fresh and ever true. Juvenal is much more serious and declamatory. He has more strength and fire, and more elevation of style than Horace, but is at the same time greatly inferior to him in gracefulness and ease. Persius is a nervous and lively writer, but has more of the fire and force of Juvenal than of the politeness of Horace. Though the name satire usually is confined to poetical compositions, prose works of a satirical character are frequently included under the same head. Among the French may be mentioned Rabelais, Montaigne, and Voltaire; in England, Pope, Swift, Fielding, Byron, Thackeray, Carlyle, Samuel Butler, and Shaw; and in the United States, Irving, Holmes, Mark Twain, Dunne ("Mr. Dooley"), etc.

SATOLLI, FRANCIS, a Roman Catholic delegate; born in Merciano, Perugia, Italy, July 21, 1831; was educated for the Church; appointed Professor of Dogmatic Theology at Urban College of the Propaganda, Rome; and was made archbishop in June, 1888. He was created president of the Academy of Noble Ecclesiastics; represented the Pope at the centenary of the Roman Catholic hierarchy in the United States in 1889; and was appointed the first apostolic delegate to the United States in 1893, continuing until 1896. He died Jan. 8, 1910.

SATRAPS, in the ancient Persian empire, the governors of the provinces which were called satrapies. The power of the satrap, so long as he retained the favor of his sovereign, was absolute; he levied taxes at his pleasure and aped the capricious tyranny of his master unchecked.

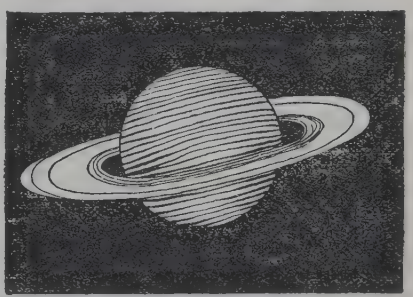
SATSUMA WARE, a fine kind of pottery or semi-porcelain made in Japan, having a felspathic glaze of a light straw color, the surface of which is covered with a net-work of fine cracks. Red and green colors and dulled gold are employed for decorating the ware, a favorite ornament being the chrysanthemum, and pheasants and other fowls are also frequently introduced. Fine old Satsuma ware is highly esteemed by collectors.

SATURATION, the act of saturating, penetrating, or impregnating completely; the state of being saturated. In chemistry, that point at which a substance ceases to have the power of dissolving or combining with another.

SATURDAY (from Anglo-Saxon *Sæterdæg, Sæterndæg—Sæter, Sætern*, for Saturn, and *dæg*, a day—the day presided over by the planet Saturn), the seventh or last day of the week; the day of the Jewish Sabbath.

SATURN, in mythology, the youngest son of Cœlus (Uranus) and Gæa, the goddess of the earth. Being banished by Jupiter from heaven, he fled to Latium, and was received by Janus, King of Italy, who made him his partner on the throne. Saturn occupied himself in softening the barbarous manners of the people of Italy, and in teaching them agriculture and the useful and liberal arts. His reign there was so mild and beneficent that mankind have called it the Golden Age, to intimate the happiness and tranquillity which the earth then enjoyed. He is generally identified with the Greek Kronos (Time), and the festival in his honor, called "Saturnalia," corresponded with the Greek "Kronia." He is generally represented as an old man, bent through age and infirmity, holding a scythe in his right hand. His temple was the state treasury.

SATURN, in astronomy, the 6th of the major planets in order of distance from the sun, and the outermost known to the ancients. With its ten satellites and



SATURN

wonderful ring system it is to be regarded as the most remarkable body in the solar system, as well as the most beautiful. The ball of the planet itself has a density of only five-sevenths that of water, rotates

on its axis (which is inclined about 27° to its orbit plane) in about 10 hours 14 minutes, is about 73,000 miles in mean diameter; but on account of its huge size and rapid rotation it has an ellipticity of about 0.10, its equatorial diameter being about 73,000 miles, and its polar diameter only about 68,000 miles. Its mean apparent diameter varies with its varying distance from the earth between 14″ and 20″. Its surface is marked by belts parallel to its equator, the equatorial ones being the brightest part of the surface, but they are not so decided as those of JUPITER (q. v.), and they have no permanent markings. The above rotation time was determined by Prof. Asaph Hall from a bright spot which suddenly appeared on the planet in 1876 and continued visible for several weeks.

The ring system is the most remarkable feature, having an extreme diameter of about 168,000 miles and a width of about 36,000 or 37,000 miles. This width is divided into three principal parts, the outer ring about 10,000 miles wide, the middle ring about 16,500 miles wide, and the inner or dusky ring about as wide as the outer one. The division between the outer ones is sharp and permanent, and about 1,600 miles wide. The bright middle ring fades into the dusky one without any sharp boundary line between them. This dusky ring comes within about 9,000 or 10,000 miles of the planet's equator. It was not discovered till November, 1850, and then by G. P. Bond, of Cambridge, Mass., and about two weeks later, independently, by Dawes, of England. It is not at all prominent at any time, and only visible with a good telescope.

Satellites.—The principal elements of the satellite system of Saturn are as follows:

Name.	Discovery.	Sidereal Period		
		D.	H.	M.
Mimas	W. Herschel, 1789	0	22	37
Enceladus	" " "	1	8	53
Tethys	J. D. Cassini, 1684	1	21	18
Dione	" " "	2	17	41
Rhea	" " 1672	4	12	25
Titan	Huyghens, 1655	13	22	41
Themis	W. H. Pickering, 1905	20	20	24
Hyperion	G. P. Bond, 1848	21	6	39
Iapetus	J. D. Cassini, 1671	79	7	54
Phœbe	W. H. Pickering, 1898	546	12	0

Hyperion was also independently discovered by Lassel at Liverpool only two days later than Bond's discovery. The range of the satellite system is enormous. The period of Iapetus is almost as long as that of Mercury. Iapetus is also remarkable for its variations in brightness. On the W. side of the planet it is about twice as bright as on the E., which shows that it rotates once on its axis during one revolution, keeping the same face toward Saturn as our moon does toward the earth. Titan is as bright as a 9th magnitude star, and is by far the largest of the satellites of Saturn. It is probably 3,000 or 4,000 miles in diameter, and its mass is estimated at about 1 : 4600 that of Saturn. Its large mass and its nearness to Hyperion cause large perturbations in the orbit of the latter, so much so that Hyperion's motion has been for a long time a puzzle to astronomers, and it is only lately that it is coming to be understood as offering a new case in celestial mechanics, which must be attacked by new methods of analysis. The perturbations of Titan keep the line of apsides of Hyperion's orbit in the line of conjunction with Titan, forcing the line to retrograde rapidly, whereas it would have a progressive motion according to the usual law of perturbations. The large outside orbit of Iapetus has an inclination of about 19° to the plane of the rings, but all the other satellites move exactly in that plane, and the orbits of the five inner ones are sensibly circular.

The discovery of Phœbe, the 9th satellite of Saturn, was announced March 18, 1898, by Prof. William H. Pickering, of the Harvard Observatory, Cambridge, Mass. The satellite appears on four plates taken at Harvard's Arequipa station, South America, with the Bruce photographic telescope. Saturn's new moon is the only one that has been discovered by means of photography. A tenth satellite was discovered in 1905. As to Saturn's physical condition, it is possible to advance at present only the most uncertain conjecture.

SATURNALIA, the feast in honor of Saturn, celebrated by the Romans in December, and regarded as a time of unrestrained license and merriment for all classes, even for the slaves. Hence, any time of noisy license and revelry; unrestrained, licentious revelry.

SATYR, in mythology, one of a number of rural deities of Greece, identical with the Fauni of the Latins. They are regarded as the attendants of Bacchus, and are represented as roaming through the woods, dwelling in caves, and endeav-

oring to gain the love of the Nymphs. They are usually represented with the feet and legs of goats, short horns on the head, and the body covered with thick hair.

SAUER KRAUT, or **SOUR KROUT**, a favorite German dish, consisting of cabbage cut fine, pressed into a cask, with alternate layers of salt, and suffered to ferment until it becomes sour.

SAUGUS, a town of Massachusetts, in Essex co., on the Saugus river and Massachusetts bay and on the Boston and Maine railroad. It includes three villages. Among its industries are the manufacture of bricks, spices, iron, rubber and woolen goods. Water-power is obtained from the river. Pop. (1910) 8,047; (1920) 10,874.

SAUL, King of Israel from about 1095 to 1055 B. C.; the son of Kish, a Benjamite. Selected for this office by Samuel, he obtained, by his personal courage and military capacity, several successes over the Philistines, Edomites, Moabites, and Ammonites, by means of which he consolidated the tribes and confirmed his authority. After a long reign the wild nature of the king at length showed itself in a kind of religious frenzy. This frenzy, which is briefly described in the Bible as an "evil spirit of God," led him to the massacre of the priests of Nob and various similar excesses. Meanwhile the prophet Samuel, estranged by the king's misdeeds, had anointed David as his successor, and this took effect when Saul was slain on Mount Gilboa.

SAULSBURY, WILLARD, an American lawyer and legislator. He was born in Georgetown, Del., in 1861, and after receiving his preliminary education, went to the University of Virginia, and was admitted to the bar in 1882. He then engaged in practice in Wilmington, Del., and became a prominent figure in local legal and business circles. Coming from a family prominent in the Democratic politics of Delaware, he soon began to have weight in the Democratic councils of the State, and was delegate-at-large at the Democratic National conventions in 1896, 1904, and 1912. He was United States Senator in 1913–19, but was defeated for re-election. He had a large part in the consolidation of the street and electric railways of Wilmington, and is director of a number of trust companies and banks.

SAULT SAINTE MARIE, a city of Canada, the district town of Algoma District, Ontario. It is opposite the city of the same name in Michigan, and is on the St. Marys river, the St. Marys Falls ship canal, and on the Canadian Pacific and Hudson Bay railways. It is the center of steel, and pulp and paper industries, and is an inland port of great importance. It has also an extensive trade in timber, agricultural products, and mining products. It has federal and district buildings, a public library, and a technical school. Pop. about 20,000.

SAULT SAINTE MARIE, a city of Michigan, the county seat of Chippewa co. It is on the St. Marys river and on the Canadian Pacific, the Duluth, South Shore, and Atlantic, and the Minneapolis, St. Paul, and Sault Ste. Marie railroads. The St. Marys canal here connects Lake Superior and Lake Huron, over which is carried an immense traffic. The International Bridge crosses the rapids of the St. Marys river. The rapids near the city generate abundant water power, which is used by several important industries, which include paper mills, lumber mills, carbide factory, tanneries, flour mills, etc. The city has a public library, high school, armory, Federal building, and a park. Pop. (1910) 12,615; (1920) 12,096.

SAULT SAINTE MARIE FALLS. See ST. MARY'S RIVER.

SAUMUR, a town of France, in the department of Maine-et-Loire; on the Loire river, and on an island in it, 38 miles W. by S. of Tours. The most prominent buildings are an old castle (now arsenal and powder magazine), the 16th-century town house, some interesting churches, and private houses of good French architecture. There are a town museum and a cavalry school. Rosaries and articles in enamel are manufactured. Saumur was a stronghold of the Protestants during the reign of Henry IV. Its prosperity was annihilated by the revocation of the Edict of Nantes, and its population reduced to a fourth. From 1598 till 1685 it was the seat of a famous school of Protestant theology, the most conspicuous professors being John Cameron of Glasgow (1579–1625) and his pupils Amyraut (or Amyraldus, 1596–1664) and Cappel (1585–1658). The school was noted for its freedom in Biblical criticism and was denounced by the opposing school of Sedan as heretical. Saumur was brilliantly captured by Larochejaquelein and the Vendeans in the summer of 1793. The largest dolmen in France is 1½ miles S. of the town; and prehistoric caves line the river. Pop. about 16,500.

SAURIA, or **SAURIANS**, an order of reptiles, including all those which, like the crocodile and lizard, are covered with scales and have four legs. The most gigantic and remarkable specimens of saurian reptiles are now extinct, but their fossil remains, immense in size and wonderful as they appear, afford incontest-

able evidence of their similarity in structure to the harmless little lizard of the present day.

SAURIDÆ, the gar-pike family, comprising elongated fishes covered with scales of stony hardness, which are extended into imbricated spines on the first rays of all the fins; about 25 species, all American, are known. The genus *Lepidosteus*, containing the gar fishes of the Northern lakes, Western and Southern rivers, is characterized by elongated slightly unequal jaws, which are furnished over their whole inner surface with rasp-like teeth, and a row of long, pointed teeth along their edges.

SAUROPODA, according to Marsh, an order of dinosauria, which he raises to a class. Fore and hind limbs nearly equal; feet plantigrade, pentadactyle, ungulate; anterior vertebræ opisthocœlian; sternal bones paired; premaxillaries with teeth. They were herbivorous, and attained their greatest development in the Jurassic. Families: *Atlantosauridæ*, *Diplodocidæ*, and *Morosauridæ*.

SAUROPSIDA, a primary group or province of vertebrata, comprising reptiles and birds. An epidermic skeleton, in the form of scales or feathers, is almost always present. The centra of the vertebræ are ossified, but have no terminal epiphyses; the skull has a completely ossified occipital segment; mandible always present, and each ramus consists of an articular ossification, connected with the skull by quadrate bone. The apparent ankle joint is situated between the proximal and distal divisions of the tarsus, not between the tibia and the astragalus, as in the mammalia. The heart is tri- or quadri-locular, and some of the blood corpuscles are red, oval, and nucleated. Respiration is never effected by means of branchiæ, but after birth is performed by lungs. The cerebral hemispheres are never united by a *corpus callosum*. The reproductive organs open into the cloaca; the oviduct is a Fallopian tube with a uterine dilatation in the lower part. All are oviparous or ovoviviparous; there are no mammary glands; the embryo has an amnion and a large respiratory allantois, and is nourished at the expense of the massive vitellus.

SAURY, the *Scomberesox saurus*, a fish called also the skipper. It is from 12 to 18 inches long, about an inch in depth, and the jaw has a hinge movement as in Belone. The name is sometimes extended to the whole genus *Scomberesox*.

SAUSAGE, an article of food, consisting of chopped or minced meat, as pork, beef, or veal, seasoned with sage, pepper, salt, etc., and stuffed into properly cleaned entrails of the ox, sheep, or pig, twisted at short intervals into sections.

SAUTERNE, a kind of white Bordeaux wine, made from grapes grown in the neighborhood of Sauternes, in the department of Gironde, France.

SAVAGE, MINOT JUDSON, an American clergyman; born in Norridgewock, Me., June 10, 1841. He was graduated at the Theological Seminary at Bangor, 1864; went to California as a Congregational home missionary, and preached at San Mateo and at Grass Valley. He removed to Framingham, Mass.; thence was called to Indianapolis, and afterward to Hannibal, Mo. He accepted a call to the Third Unitarian Church in Chicago in 1873, and after a year there was installed pastor of the Church of the Unity, Boston, where he remained for 22 years. After 1896 he was minister in the Church of the Messiah, New York, in association with Dr. Robert Collyer. In his very active career he has published over 30 books on religious, social, and moral questions, among which may be mentioned: "The Religion of Evolution" (1876); "Social Problems" (1886); "Jesus and Modern Life" (1893); "A Man" (1895); "Religion for Today" (1897); "Poems" (1882); "Our Unitarian Gospel," "The Minister's Handbook," "Psychics," "Life Beyond Death," and "Life's Darkest Problems" (1905), etc. He died in 1918.

SAVAGE ISLAND, a small coral island in the Pacific ocean, between the Samoan and Tongan islands. It is about 30 miles in circuit. It was annexed by Great Britain in 1888 and to New Zealand in 1901. Pop. 3,880.

SAVANNA, or **SAVANNAH**, an extensive open plain or meadow in a tropical region, yielding pasturage in the wet season, and often having a growth of undershrubs. The word is used chiefly in tropical America.

SAVANNA, a city of Illinois, in Carroll co. It is on the Mississippi river and on the Chicago, Milwaukee, and St. Paul and the Chicago, Burlington and Quincy railroads. Its industries include storage elevators and a sash and door factory. Pop. (1910) 3,691; (1920) 5,237.

SAVANNAH, a city and county-seat of Chatham co., Ga.; on the Savannah river, 18 miles from its mouth, and on the Central of Georgia, the Atlantic Coast Line, the Seaboard Air Line, and the Southern railroads; 90 miles S. W. of Charleston. It is built on a bluff of sand, about 40 feet above low water, and has a water frontage of about 3 miles, the city receding about 2 miles from the river.

Business Interests.—Next to New Orleans, Savannah is the most important commercial city in the South. The largest vessels can enter the harbor, and the river is navigable as far as Augusta. There is regular steamboat communication with Baltimore, Philadelphia, New York, Boston, Liverpool, and the principal Southern cities. It holds the second place in the United States as a cotton emporium, and also exports in large quantities rice, lumber, fertilizers, and naval stores. In the fiscal year ending June 30, 1919, the value of imports aggregated $16,747,224; exports, $341,171,319. In 1914 the investment in industrial enterprises was $10,247,000, and the value of the product was $6,709,000. There are National and several other banks, and a large number of daily and weekly newspapers. The assessed property valuations exceed $60,000,000, and the total bonded debt is about $6,700,000.

Public Interests.—The city has an area of 6.8 square miles; an excellent street system; a system of waterworks that cost $1,250,000; and a sewer system covering nearly 25 miles. The streets are lighted by electricity. There is a public school enrollment of over 10,000 pupils, and annual expenditures for public education of about $200,000. The city contains a custom house, court house, Guard's Arsenal, Chatham Academy, Cotton Exchange, Telfair Academy of Arts, a medical college, Convent of St. Vincent de Paul, St. Joseph's Infirmary, Episcopal Orphans' Home, and other charitable institutions.

History.—Savannah was founded in 1733 by General Oglethorpe. In 1776 a British fleet, attempting to take the town, was repulsed after a severe action; and it was taken in 1778, and held in October, 1779, against the combined American and French forces. In the latter action Count Pulaski was killed. Savannah received its city charter in 1789. During the Civil War it was blockaded by the Federal navy, and on Dec. 12, 1864, it was occupied by General Sherman. Pop. (1910) 65,064; (1920) 83,252.

SAVANNAH, a river of the United States, which forms the N. E. boundary of Georgia, and separates it from South Carolina. It is formed by the junction of the Tugaloo and Kiowee, 100 miles by the course of the river above Augusta, and is navigable to the city of Savannah for vessels drawing over 28 feet.

SAVARY (sä-vä-rē'), **ANNE JEAN MARIE RENÉ, DUC DE ROVIGO**, a French military officer; born in Marcq, France, April 26, 1774. He entered the army as a volunteer in 1790, served with distinction on the Rhine, in Egypt, and in the battle of Marengo (1800). Napoleon made him commander of his bodyguard and employed him in diplomatic affairs. In 1804, as commandant of the troops stationed at Vincennes, he presided at the execution of the Duc d'Enghien; and in the wars of 1806–1808 he acquired high military reputation at Jena, in the capture of Hameln, and by his victory at Ostrolenka (Feb. 16, 1807). Created Duke of Rovigo, he was sent to Spain, and negotiated the perfidious arrangement by which the Spanish king and his son were kidnapped. In 1810 he superseded Fouché as minister of police. After the fall of Napoleon he wished to accompany him to St. Helena; but he was confined by the British Government at Malta, making his escape finally to Smyrna. He returned to Paris in 1818. In 1831 he was appointed Commander-in-Chief of the army in Algeria; but ill-health caused him to resign. He wrote his "Memoirs" in 1828. He died in Paris, June 2, 1833.

SAVE (säv), or **SAU** (sow), a river of Jugoslavia. It rises in the Julian Alps; flows S. E. through Carniola, separates Carniola from Styria, flows through Croatia, and after a course of about 540 miles joins the Danube at Belgrade. It is in great part navigable.

SAVINGS BANKS. Savings banks in the United States are classified as commercial and government or postal. There are two kinds of commercial savings banks, mutual and stock. The former are found chiefly in the eastern part of the country, while the latter are most numerous in the West and South. There were on June 30, 1919, 622 mutual and 1,097 stock savings banks. This does not include the savings departments of national banks and trust companies. The 622 mutual savings banks have total resources amounting to $5,171,551,000. This total includes loans and discounts amounting to $2,335,996,000 and investments in bonds and securities amounting to $2,491,607,000. The surplus funds amount to $333,420,000 and the undivided profits to $65,013,000. The individual deposits amount to $4,751,113,000. The aggregate resources of the 1,097 stock savings banks was $1,281,254,000. The loans and discounts amount to $777,941,000, the capital stock to $62,740,000, the surplus and undivided profits to $47,741,000, and the individual deposits to $1,151,464,000.

School savings banks were established in the United States in 1885.

SAVONAROLA, GIROLAMO, an Italian reformer; born of a noble family in Ferrara, Sept. 21, 1452. He was educated at home, and at a very early age became deeply versed in the philosophy of the schools; but his disposition was from the

first tinged with religious asceticism, and in 1474 he formally withdrew from secular affairs and entered the Dominican Order at Bologna. Having completed his novitiate and the studies of the order, he seems to have made his first public appearance as a preacher in 1482, at Florence, where he had entered the celebrated convent of his order, San Marco, and where he preached the Lent in that year. His first trial, however, was a failure. His voice was harsh and he failed to interest. He was later sent to a convent in Brescia, where his zeal began to attract notice, and the disadvantages of manner and address ceased to be felt under the influence of his sterling genius and irresistible enthusiasm. In 1489 he was once more recalled to the convent of San Marco in Florence.

His second appearance in the pulpit of San Marco was a complete success. The great subject of his declamation was the sinfulness and apostasy of the time and denunciation of the vices and crimes of his age. Under the rule of the great head of the Medici family, Lorenzo the Magnificent, art, literature, and philosophy had all followed the common direction of that elegant but semi-pagan revival which the scholars of the 15th century had inaugurated; and the whole spirit of the social as well as intellectual movement of which Florence, under the Medici, was the center, was utterly at variance with the lofty Christian spirituality and severe asceticism in which Savonarola placed the very first conditions of the restoration of true religion and morality. His preaching, therefore, in its spirit, as well as in its direct allusions, was no less antagonistic to the established system of the government than to the worldly and irreligious manners of the age.

Up to this time Savonarola's relations with the Church were, if not of harmony, at least not of antagonism; and when, in the year 1493, a reform of the Dominican Order in Tuscany was proposed under his auspices, it was approved by the Pope, and Savonarola was named the first vicar-general. About this date, however, his preaching had assumed a directly political character, and the predictions and denunciations which formed the staple of many of his discourses pointed plainly to a political revolution in Florence and in Italy as the divinely ordained means for the regeneration of religion and morality. In one of his discourses he pointed plainly to the advent of the French under Charles VIII.; and when this prediction was fulfilled by the triumphant appearance of the French expedition, Savonarola was one of a deputation of Florentines sent to welcome Charles VIII. as the savior of Italy, and to invite him to Florence. Very soon, however, the French were compelled to leave Florence, and a republic was established, of which Savonarola became, though without political functions, the guiding and animating spirit, his party, who were popularly called *Piagnoni*, or "Weepers," from the penitential character which they professed, being completely in the ascendant.

It was during this brief tenure of influence that Savonarola displayed to the fullest extent both the extraordinary powers of his genius and the full extravagance of the theories to which his enthusiastic asceticism impelled him. The republic of Florence was to be the model of a Christian commonwealth, of which God Himself was the chief ruler, and His Gospel the sovereign law; and thus the most stringent enactments were made for the repression of vice, and of all the sinful follies by which it is fomented and maintained.

The extremes of his rigorism; the violence of his denunciations, which did not spare even the Pope himself (Alexander VI.); the assumption by him, or attribution to him, of a supernatural gift of prophecy; and the extravagant interpretation of the Scriptures, and especially of the Apocalypse, by which he sought to maintain his views, drew on him the displeasure of Rome. He was cited, in the year 1495, to answer a charge of heresy at Rome; and, on his failing to appear, he was forbidden to preach; the brief by which the Florentine branch of his order had been made independent was revoked; he was offered a cardinal's hat on condition of his changing his style of preaching—an offer he indignantly refused; and he was again forbidden to preach. Once again Savonarola disregarded this order. But his difficulties at home now began to deepen. The measures of the new republic proved impracticable. The party of the Medici, called "Arrabbiati" ("Enraged"), began to recover ground. A conspiracy for the recall of the exiled house was formed; and though, for the time, it failed of success, and five of the conspirators were condemned and executed, yet this very rigor served to hasten the reaction.

At the critical point of the struggle of parties came, in 1497, a sentence of excommunication from Rome against Savonarola. Savonarola openly declared the censure invalid, because unjust, and refused to hold himself bound by it. During the plague Savonarola, precluded by the excommunication from administering the sacred offices, devoted himself zealously to ministering to the sick monks. A second "bonfire of vanities" in 1498 led to riots. In the same year, when the new elections took place, the party opposed to

Savonarola, the Arrabbiati, came into power. He was ordered to desist from preaching; and the struggle was brought to a crisis by the counterdenunciations of a preacher of the Franciscan order, long an antagonist of Savonarola, Francesco da Puglia. In the excited state of the popular mind thus produced an appeal was made by both of the contending parties to the interposition of divine providence by the ordeal of fire; and one of Savonarola's disciples agreed to make trial of the dread ordeal along with a Franciscan friar. But at the moment when the trial was to have come off (April, 1498) difficulties and debates arose, and nothing was actually done. The result of this was to destroy with the populace the prestige of Savonarola's reputation, and to produce a complete revulsion of public feeling.

In the midst of this reaction he was cited before the council, and brought to trial for falsely claiming to have seen visions and uttered real prophecies, for other religious errors, and for political insubordination. He denied the charges; but, put to the torture, he made avowals which he afterward withdrew. The conclusion was a foregone one; he was declared guilty of heresy and of seditious teaching, and of being an enemy to the peace of the Church. The acts of the trial were sent to Rome, where the sentence was confirmed; he, with two disciples of his order, was given up to the secular power; so on May 23, 1498, this extraordinary man and his two companions, brothers Domenico and Silvestro, were strangled, and their bodies burned by the executioner.

SAVOY (sa-voi'), a former duchy of the kingdom of Sardinia, now annexed to France, and forming the departments of Savoie and Haute-Savoie, having N. and N. E. Switzerland, S. E. and S. Piedmont, and W. the departments of Isère and Ain; area, 4,162 square miles. It is the most elevated country of Europe, consisting principally of mountains, the highest of which is Mont Blanc. The valleys and low grounds are fertile and well cultivated. Rivers: Rhône, Arve, Drance, and Isere; lakes: Annecy and Bourget. Products: wheat, oats, barley, rye, and hemp. Minerals: iron, copper, silver, lead, coal, and salt. Manufactures, cotton and woolen fabrics, hosiery, watches, clocks, glass, earthenware, etc. Capital of Savoie, Chambéry; of Haute-Savoie, Annecy. Savoy was anciently a part of Sapaudia, whence the name Saboia, or Savoy, is derived. It was erected into a duchy under Amadeus VIII., in 1416, and was ceded to France in 1860. Pop. about 500,000.

SAVOY, HOUSE OF, one of the most ancient royal families, and also distinguished for having produced a remarkable number of eminent warriors and statesmen. Its origin is not historically established, but most genealogists trace it to a German count, Humbert, who, in the 11th century, established himself on the W. slope of the Alps between Mont Blanc and Lake Leman. In 1111 his descendants were enrolled among the counts of the Holy Roman empire. Count Amadeus, in 1383, founded a law of primogeniture which greatly strengthened the family, leading to the immediate acquisition of the territory of Nice. In 1416 the Counts of Savoy adopted the title of duke; and in 1418 they acquired the principality of Piedmont. Taking part in the great wars between France and the Holy Roman empire, now on the one side and then on the other, as policy dictated, the Princes of Savoy increased their possessions in all directions, but chiefly toward the S.; and at the peace of Utrecht in 1713 they obtained the island of Sicily, with the title of king. Sicily had to be exchanged, in 1718, for the isle of Sardinia, to which henceforth the royal dignity remained attached. Genoa and the surrounding territory were added to the Sardinian crown at the peace of 1815. The direct male line of the house of Savoy died out with King Charles Felix, in 1831, and the existing Salic law prohibiting the accession of females, the crown fell to Prince Charles Albert, of the House of Savoy-Carignan. The latter branch—taking its name from a small town in the province of Turin, was founded by Thomas Francis, born in 1596, a younger son of Duke Charles Emanuel I. of Savoy. King Charles Albert, the first of the house of Savoy-Carignan, abdicated the throne, March 23, 1849, in favor of his son, Victor Emmanuel II., the first King of Italy. See VICTOR EMMANUEL.

SAVU, SAVOU, or **SAVOE,** an island of the Malay Archipelago S. W. of Timor; area, 231 square miles. It yields millet, maize, sugar cane, cotton, tobacco, etc., and its Malayan inhabitants are subject to the Dutch government of Timor. Pop. about 26,000, principally Malays.

SAW, an instrument with a serrated or dentated blade, the teeth of which rasp or cut away wood or other material, making a groove known as a kerf. The Greeks claim the invention of the saw, but it occurs on the Egyptian monuments. Saws of the bronze age have been found in Germany and Denmark; and in the stone age rude saws of flint were affixed to wooden handles by bitumen. The Caribs formerly employed

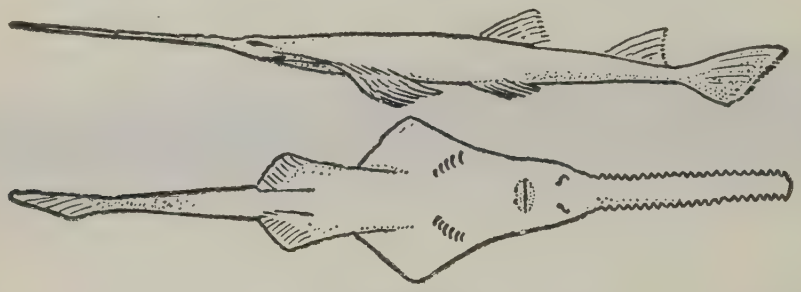
saws of notched shells, and the Tahitians of sharks' teeth.

Modern saws vary in size and form, but may be divided into handsaws and machine saws, of which the first are the more numerous. Of hand saws the most commonly used are the gang saw, the crosscut saw, the frame saw, the hand saw, the panel saw, the keyhole saw, the bow saw, the ripping saw, the sash saw, the tenon saw, etc. Machine saws are divided into circular, reciprocating, and band saws. The circular saw is a disk of steel with teeth on its periphery; it is made to revolve at great speed, while the material to be cut is pushed forward against it by means of a traveling platform. The reciprocating saw works like a two-handled hand saw, but it is fixed and the material pushed forward against its teeth. The band saw consists of a thin endless saw placed over two wheels, and strained on them. It passes down through a flat sawing table, upon which the material to be cut is laid.

SAW-BILL, a family of birds, *Trinitiæ*, order *Insessores*, comprising birds with the bill as long as the head, gently decurved near the tip, but not hooked, and the cutting edges dentated; the tarsi rather long, feet large, the middle and outer toes connected for more than half their length. This family is represented in North America by *Monotus cœruliceps*, the saw-bill of Mexico.

SAWDUST, the accumulated particles caused by sawing wood, stone, etc. Besides the more common uses of sawdust, it is commercially valuable as the basis of various manufactures. Oxalic acid is manufactured on a large scale from wood sawdust. Sawdust is also used in the "carbonating" stage of the process for the manufacture of soda ash. The substance called *bois-durci* (hardened wood), of which beautiful ebony-like medallions and other ornaments are made, consists of the fine sawdust of rosewood, ebony, and other woods formed into a paste and pressed into molds or dies. The sawdust of mahogany and rosewood is used in dressing furs, and the small fragments of some woods, such as the pencil cedar, made by saw cuts or the turning tool, yield perfumes. Sawdust sinks in water though the wood from which it is cut floats.

SAWFISH, a popular name for any species of the genus *Pristis*, from the saw-like weapon into which the snout is produced. They are common in tropical and less so in subtropical seas, and attain a considerable size, specimens with a saw six feet long and a foot broad at the base being far from rare. Their offensive weapon renders them dangerous to almost all other large inhabitants of the ocean. The sawfish use their rostral weapon in tearing off pieces of flesh from their prey or in ripping open the abdomen, when they seize and devour the detached portions or the protruding soft parts.



SAWFISH

SAWFLIES, a group of insects belonging to the order *Hymenoptera* and distinguished by the peculiar conformation of the ovipositor of the females, which is composed of two broad plates, with serrated or toothed edges, by means of which they incise the stems and leaves of plants, and deposit their eggs in the slits thus formed. The turnip fly, *Athalia centifoliæ*, and the gooseberry fly, *Nematus grossulariæ*, are examples.

SAXE, MAURICE, COUNT DE, a French military officer; a natural son of Augustus II., King of Poland; born in Goslar, Prussia, Oct. 28, 1696. He entered the army at an early age, and was present with Prince Eugene at the siege of Tournay. In 1720 he went to Paris. After an unsuccessful attempt to get himself elected Duke of Courland he took service in the French army, distinguished himself in the campaign of 1733–1735, and was made lieutenant-general. In the general war which followed the death of the Emperor Charles VI., Saxe took a

distinguished part. He captured Prague, defended Alsace, and in 1743 was named Marshal of France. In the following year he held a command in Flanders. One of his most brilliant achievements was his victory over the English and Hanoverian forces at Fontenoy in May, 1745. He was at the time "nearly dead of dropsy; could not sit on horseback, except for a few minutes; was carried about in a wicker bed; had a lead bullet in his mouth all day, to mitigate the intolerable thirst." (Carlyle.) The victories of Roucoux and Laufeldt, and the capture of Maestricht, added to his fame in two following years. Saxe was a man of great size and strength, intrepid, self-possessed, and as a commander won fame for his ingenuity and dash; but he was one of the most dissolute men of his age. George Sand, the eminent author, was descended from an illegitimate daughter of his. He wrote a work on the art of war, called "My Reveries." He died in his palace of Chambord, near Blois, France, Nov. 30, 1750.

SAXE, JOHN GODFREY, an American humorous poet; born in Highgate, Vt., June 2, 1816. In 1872 he became editorially connected with the Albany "Evening Journal," and subsequently contributed to "Harper's Magazine" and the "Atlantic Monthly." He was also well known as a lecturer. His most popular verses include "Rhyme of the Rail" and "The Proud Miss McBride"; and his published works: "The Money King" (1859); "The Flying Dutchman; or, The Wrath of Herr von Stoppelnose" (1862); "The Masquerade and Other Poems" (1866); "Fables and Legends in Rhyme" (1872); and "Leisure-Day Rhymes" (1875). He died in Albany, N. Y., March 31, 1887.

SAXE-ALTENBURG, formerly a Duchy, but since 1919 part of Thuringia; a state of the German Republic. Area 511 square miles. The eastern or Altenburg division is very fertile, while the western or Saal-Eisenburg portion is hilly and wooded. The capital is Altenburg. Pop. about 216,000.

SAXE-COBURG-GOTHA, formerly a Duchy, but since 1919 a part of Thuringia, a state of the German Republic, comprising the province of Gotha, lying between Prussia, Schwarzburg, Meiningen, and Weimar; and the province of Coburg, lying between Meiningen and Bavaria; Coburg 218 square miles, and Gotha 548 square miles. The S. of Gotha and the N. of Coburg are both mountainous. Both divisions are fertile; the hills are covered with wood, and in Gotha coal and other minerals are found. Prior to the World War, the chief occupations of the inhabitants, particularly in Coburg, were cattle rearing and agriculture. In Gotha there were manufactures of linen, leather, metal-wares, etc. The population profess the Lutheran faith. The Prince Consort of England, husband of Queen Victoria, was the younger brother of Duke Ernest II., and Prince Alfred of Great Britain, Duke of Edinburgh succeeded his uncle in 1893, dying in 1900, without a son. He was succeeded by the Duke of Albany, nephew of King Edward VII of England. He was forced to abdicate in 1918 as the result of the German revolution. Gotha joined the Republic of Thuringia, Coburg that of Bavaria. Pop. of Gotha (1919) 433,959; of Coburg, 74,344.

SAXE-MEININGEN, under the Empire a Duchy but now part of Thuringia, a state of the German Republic, consisting of a main body and several minor isolated portions; area, 953 square miles. The greater part of the surface is hilly, and the principal crops are oats, buckwheat, potatoes, turnips, hemp, and the pastures rear considerable numbers of cattle, sheep, and horses. The minerals include iron and copper, worked to a small extent, and the manufactures are chiefly ironware, porcelain, glass, etc. The government under the empire was hereditary and constitutional with a representative chamber of 24 members. The capital is Meiningen. Pop. (1919) 191,491.

SAXE-WEIMAR, or **SAXE-WEIMAR-EISENACH**, under the Empire a Grand-Duchy, since 1919 part of Thuringia, a state of the German Republic. Area, 1,397 square miles. The forests are very extensive, and form the principal wealth of the grand-duchy. The minerals are unimportant. In Eisenach woolen, cotton, and linen tissues, ribbons, and carpets, etc., are made. The chief town is Weimar, and there is a university at Jena. Pop. (1919) 270,015.

SAXHORN, a brass wind instrument, invented by Adolph Sax, constructed in such a manner that the large portion, after passing under the arm of the performer, repasses over his shoulder, presenting the bell to the front. The advantage of this shape is that it avoids the elbows, which would otherwise impair the progress of the sound. Saxhorns have great powers, more especially the contra bassos in E and B flat; the latter of which has 48 feet of development in its tube.

SAXIFRAGA, in botany, saxifrage, the typical genus of *Saxifragaceæ*. Perennial plants, rarely herbs, with white or yellow, or rarely red or purple, cymose inflorescence. Known species, 160.

Not found in Australia, South Africa, or the South Sea Islands; distributed in most other regions.

SAXIFRAGACEÆ, or **SAXIFRAGEÆ**, in botany, saxifrages; the typical order of the alliance Saxifragales, herbs often growing in patches. Known genera 19, species 310. (Lindley.) Genera 19, species 250, including the Ribesieæ. (Sir Joseph Hooker.) Most of the species are from the North Temperate and Arctic zones.

SAXONS, a Germanic people, whose name is usually derived from an old Teutonic word *sahs*, meaning "knife," though some authorities believe it to be another form of *Sassen*, "The settled people," are first mentioned by Ptolemy as dwelling in the S. of the Cimbrian Peninsula. In the 3d century a "Saxon League" or "Confederation," to which belonged the Cherusci, the Angrivarii, the Chauci, and other tribes, was established on both sides of the estuary of the Elbe and on the islands off the adjacent coast. During the reigns of the Emperors Julian and Valentinian they invaded the Roman territory; but their piratical descents on the coasts of Britain and Gaul are far more famous. In 287 Carausius, a Belgic admiral in the Roman service, made himself "Augustus" in Britain by their help; and about 450 they in conjunction with the Angles established themselves permanently in the island and founded the Anglo-Saxon kingdoms. Before the 5th century they had settled along the North Sea coasts from the Elbe to the Loire, a part of what was later Flanders being called the "Saxon shore." But these Saxon settlements soon became absorbed in the kingdom of the Franks. In Great Britain too there was a Saxon shore with its count. In Roman times the coast districts of Great Britain from Brighton N. to the Wash were called Litus Saxonicum, or Saxon shore. These localities were particularly exposed to the attacks of the Saxons from across the North Sea, and were placed under the authority of a special officer, the Count of the Saxon Shore.

At home the Old Saxons enlarged their territory by conquest till it embraced all the lands between the Rhine and Elbe, the North Sea and the Harz Mountains. Along with the Franks they destroyed the kingdom of the Thuringians in 531, and obtained possession of the land between the Harz and the river Unstrut; but this region too was forced to acknowledge the Frankish sovereignty. But the Saxons having thrown off the yoke, wars between the Saxons and the Franks were constant after 719; and the latter after 772 were, under the vigorous leadership of Charlemagne, generally successful, in spite of the determined opposition offered by Wittekind (or Widukind). The desperate resistance of the Saxons was not finally broken till 804, though Wittekind submitted in 785. After the final submission the conquered people accepted Christianity, having before defended their heathen faith in conjunction with their freedom. By the treaty of Verden (843) the Saxon districts fell to Austrasia, the nucleus of the German empire. The "Saxons" of Transylvania are not all of pure Saxon descent; the name is used rather as synonymous with "German." To the Celtic Britons the English or Anglo-Saxon invaders were known only as Saxons, and *Sassenach*, or other Celtic form of the word Saxon, is still the name for Englishmen and their language alike in Wales, the Scottish Highlands, and Ireland.

SAXON SWITZERLAND, a name given to part of Saxony, on the Elbe, S. E. of Dresden and bordering on Bohemia. It consists of a group of mountains of sandstone, with valleys and streams of the most picturesque character, in which isolated masses of sandstone, large and small, occur in very fantastic shapes. It is about 24 miles long and equally wide.

SAXONY, a state in the German Republic, formerly a kingdom, now a republic; bounded on the N. W., N. and E. by Prussia; S. E. and S. by Bohemia; S. W. by Bavaria; and W. by Reuss, Saxe-Weimar, and Saxe-Altenburg; area, 5,787 square miles. For administrative purposes it is divided into the five districts of Dresden, Leipsic, Zwickau, Chemnitz, and Bautzen. Pop. about 5,000,000.

General Features.—With the exception of a very small portion of the E., which sends its waters to the Baltic, Saxony belongs to the basin of the Elbe, which traverses it in a N. W. direction for about 70 miles. Of its tributaries the most important are the Mulde and the Elster. The surface, though very much broken, may be regarded as an inclined plane, which commences in the S., in the Erzgebirge chain, and slopes toward the N. In the more elevated districts, the scenery is wild, and on either side of the Elbe, from the Bohemian frontier to Pirna, is a remarkable tract which has received the name of the Saxon Switzerland. On the Prussian frontiers, where the district subsides to its lowest point, the height above the sea is only 250 feet. The loftiest summits are generally com-

posed of granite and gneiss, and are rich in mineral products. The Erzgebirge is continued by the Riesengebirge, a branch of which, under the name of the Lausitzergebirge, or Mountains of Lusatia, covers a considerable portion of East Saxony. The climate in the loftier mountain districts is very cold, but with this exception it is milder than that of most countries of Europe under the same latitude.

Productions, Industries, etc.—The most important crops are rye, oats, barley, wheat, potatoes; and orchard fruits, particularly apples, pears, and plums, are very abundant. Considerable attention is paid to the culture of the vine. Large numbers of horned cattle are exported. The wool of Saxony has long been celebrated for its excellence. Swine and horses are of a superior breed. The minerals are of great importance and include silver, lead, tin, iron, cobalt, nickel, bismuth, and arsenic. Lignite and coal are found in various districts. The quarries furnish in abundance granite, porphyry, basalt, marble, serpentine, and sandstone. Several mineral springs of reputation exist. Saxony is an important manufacturing country, textile fabrics, such as cotton and woolen goods, linen, lace and ribbons, being the leading products. Other industries are earthenware, Dresden ware, leather, straw weaving, chemicals, etc., and the printing establishments of Leipsic are well known. Saxony is connected with the great trunk lines which traverse central Europe. The chief towns are Dresden (the capital), Leipsic, Chemnitz, Zwickau, Plauen, and Freiberg.

History.—The last ruling family in Saxony claimed descent from Wittekind, the national hero who was conquered by Charlemagne and embraced Christianity. The territory became a duchy about 880, and in the 10th century Duke Henry was elected German emperor. In 1127 the duchy passed to the Bavarian branch of the Guelph family, and after several changes Frederick the Warrior, Margrave of Meissen and Landgrave of Thuringia, became (1423) Elector of Saxony. His grandsons, Ernest and Albert, in 1485 divided the family possessions, founding the Ernestine and Albertine lines respectively, the former retaining the electoral dignity. Ernest was succeeded by his sons Frederick III. (1486-1525) and John (1525-1532), but in 1548 the elector of the Ernestine line was put under the ban of the empire, and the electorate transferred to Maurice, who represented the Albertine line which now occupies the throne. Maurice was succeeded by his brother Augustus (1553-1586), who made important additions to the Saxon territories by purchase and otherwise. His son, Christian I., died in 1691, leaving the crown to his son, Christian II. Christian's brother and successor, John George I. (1611-1656), joined Gustavus Adolphus in the Thirty Years' War, and the Saxon forces took part in Breitenfeld and at Lutzen. Frederick Augustus I. (1694-1733) embraced the Catholic religion (1697) to obtain the crown of Poland. Frederick Augustus II. also obtained the Polish crown (as Augustus III.) after a war with France and joined with Austria in the Seven Years' War. Frederick Augustus III. (1763-1827) reluctantly took part against France when war was declared by the Imperial Diet in 1793, but after the battle of Jena the elector and his army fought side by side with the French. Napoleon conferred on him the title of king, and large additions were made to the Saxon territory in 1807 and 1809. In 1813 Saxony was the scene of Napoleon's struggle with the allies, and the battles of Lutzen, Bautzen, Dresden, and Leipsic were followed by the Congress of Vienna (1814), when a large part of the dominions then under the Saxon monarch was ceded to Prussia. A period of great progress followed, interrupted somewhat at the revolutionary period of 1848-1849. In the Austro-Prussian War of 1866, Saxony took part with Austria and was occupied by the Prussian troops. Prussia desired to incorporate the kingdom, but Austria, supported by France, opposed this arrangement, and Saxony was admitted into the North German Confederation instead. In the Franco-Prussian War, Saxony united with the rest of Germany against France; and the late King Albert (then crown prince) was commander of the German army of the Meuse. On Nov. 9, 1918, the King of Saxony abdicated and the country was declared a republic.

SAXONY, PRUSSIAN, a province of Prussia, of irregular shape, and with isolated districts, almost in the center of Germany, N. of Saxony; area, 9,756 square miles. Originally a part of Saxony, it was given to Prussia by the Congress of Vienna (1814). The N. and larger portion belongs to the north German plain; the S. and S. W. is elevated or hilly, partly belonging to the Harz Mountain system, and containing the Brocken (3,742 feet). The chief river is the Elbe. The soil is generally productive, about 61 per cent. being under the plow and 20 per cent. forests. Beet sugar is largely produced. The mineral products are valuable, particularly lignite, salt, kainite, and other potash salts. The capital of the province is Magde-

burg; other towns are Halle (with a university), Erfurt, and Halberstadt. Pop. about 3,150,000.

SAXOPHONE, the name of a family of musical instruments invented by A. Sax (see SAXHORN). They consist of a conical brass tube, sounded by a mouthpiece furnished with a single reed similar to that of the clarinet, and are made in as many different keys as the saxhorn. The contralto and baritone are mostly used in Great Britain; but in France all the varieties are more or less used. They have 20 holes covered by keys and studs for the first three fingers of each hand, and are all fingered alike. They are greatly valued in military music, but are not much used in the orchestra.

SAYCE, ARCHIBALD HENRY, an English Orientalist; born near Bristol, England, Sept. 25, 1846. His works extend over various fields and are of great importance for comparative philology and history. They include: "Assyrian Grammar for Comparative Purposes" (1872); "Lectures on the Assyrian Language" (1877); "Babylonian Literature" (1877); "Ancient Empires of the East" (1884); "Assyria" (1885); "The Hittites" (1889); "Records of the Past" (new series, 1889-1892); "Life and Times of Isaiah" (1889); "The Races of the Old Testament" (1891); "Social Life among the Assyrians and Babylonians" (1891); "The Higher Criticism and the Verdict of the Monuments" (1894); "The Egypt of the Hebrews and Herodotus" (1895); "Patriarchal Palestine" (1895); "Early History of the Hebrews" (1897); "Israel and the Surrounding Nations" (1898); "Babylonians and Assyrians" (1900); etc. Special mention should be made of his "Principles of Comparative Philology" and "Introduction to the Science of Language," which have passed through many editions.

SAYRE, LUCIUS ELMER, an American educator, born at Bridgeton, N. J., in 1847. He studied at the Philadelphia College of Pharmacy, and was in business as a manufacturing chemist, from 1882 to 1885. From 1880 to 1885 he was an instructor in the Philadelphia College of Pharmacy, and from 1885 was dean of the School of Pharmacy at the University of Kansas. He was a member of the Revision Commission of the United States Pharmacopœia from 1890, and from 1907 was director of drug analysis for the State Board of Health of Kansas. He wrote "Organic Materia Medica and Pharmacognosy"; "Essentials of Pharmacy," and contributed articles on pharmaceutical subjects to magazines.

SAYRE, THEODORE BURT, an American author and playwright, born in New York in 1874. He was educated in private schools in New York and the New York College of Pharmacy. From 1899 to 1914 he was a reader of plays and a critic for Charles Frohman. His published novels include "Two Summer Girls and I" (1898); "Tom Moore" (1902). Among his numerous plays are "Tom Moore" (1901); "O'Neill of Derry" (1907); "The Commanding Officer" (1910); "Love's Young Dream" (1912); "The Irish Dragoon" (1915); "The Irish Fifteenth" (1916); "Lucky O'Shea" (1917).

SAZONOFF, SERGI DIMITRIEVITCH, a Russian statesman, born in 1861. In 1890 he was appointed second secretary to the Russian Embassy in London, where he obtained his first diplomatic training. Here he remained for two years, then, after filling a number of posts in European cities, he returned to London in 1904 as Councillor of the Embassy. It was shortly after that he distinguished himself by his handling of the Dogger Bank incident, when the Russian fleet, bound for the Orient, fired on a number of fishing vessels on the Dogger Bank, in the belief that it had been attacked by a Japanese submarine. As a result of this triumph, Sazonoff was sent as Minister to the Vatican, in 1906. Three years later he was recalled to Russia to assist Minister of Foreign Affairs Isvolsky, whom he succeeded in 1910. He was still holding this post in 1914, at the outbreak of the World War, and had a powerful influence in drawing the British and Russian governments close together. In 1916 he was forced to resign, which was the first incident to arouse the suspicion of the Allied world that the Russian Government was not entirely sincere in its desire to defeat Germany in the war. Since the Revolution of 1917, and especially after the coming into power of the Bolsheviki, in November of that year, Sazonoff has been an exile abroad, where he has represented certain anti-Bolshevist elements among the Russians.

SCAB, in sheep, like itch in man, or mange in horses or dogs, depends on the irritation of three varieties of minute acari, some of which burrow in the skin, especially if dirty and scurfy, causing much itching, roughness, and baldness. The parasite readily adheres to hurdles, trees, or other objects against which the affected sheep happen to rub themselves, and hence is apt to be transferred to the skins of sound sheep. Chief among the approved remedies are diluted mercurial ointments, tobacco dip, turpentine and

oil, and arsenical solutions such as are used for sheep dipping.

SCABBARD, the sheath of a sword or bayonet, made of metal, wood, leather, rawhide, or paper.

SCABBARD FISH, the *Lepidopus caudatus*, fairly common in the Mediterranean and the warmer parts of the Atlantic. It is probably a deep sea fish. Its length is from five to six feet, dorsal extending the whole length of the body, which is much compressed. It is well known in New Zealand, where it is called the frost fish and is much esteemed for food.

SCABIOSA, the scabious; a genus of *Dipsaceæ*, involucel, membranous or minute; receptacle hemispherical, hairy, or with scaly floral bracts; fruit with eight depressions; known species about 90, from the Eastern Hemisphere. *S. succisa* yields a green dye, and seems astringent enough to be used in tanning.

SCABIOUS (*Scabiosa*), an extensive genus of annual and perennial herbs, belonging to the natural order *Dipsaceæ*. They are annual or perennial herbs, with entire or divided leaves and heads of blue, pink, white or yellowish flowers. *S. succisa*, devil's bit, is a common plant. It was formerly supposed to be of great efficacy in all scaly eruptions, hence the name.

SCAD or HORSE MACKEREL (*Caranx trachurus*, or *Trachurus vulgaris*), a genus of fishes included in the family *Scomberidæ* or mackerels, and found around the coasts of Great Britain. It appears in large shoals, and the flesh, though coarse, is esteemed and eaten salted during the winter months.

SCÆVOLA, CAIUS MUCIUS, an illustrious Roman, who distinguished himself when Porsenna besieged Rome, 507 B. C. Mucius entered the camp of Porsenna to assassinate him and by mistake stabbed one of his attendants. Being seized and brought before Porsenna, he said that he was one of 300 who had engaged, by oath, to slay him; and added, "This hand, which has missed its purpose, ought to suffer." On saying this, he thrust it into the coals which were burning on the altar, and suffered it to be consumed. Porsenna, struck with his intrepidity, made peace with the Romans. The name of Scævola, or "Left-handed," was given as a mark of distinction to Mucius and his family.

SCAFELL (skâ-fĕl'), a double-peaked mountain, the loftiest summit in England, on the Westmoreland border of Cumberland; 14½ miles S. S. W. of Keswick. Of the two peaks, the higher, Scafell Pike, attains 3,210 feet, the other 3,161.

SCAGLIA, a red, white, or gray argillaceous limestone occurring in the Venetian Alps, and believed by De Zigno to be the age of the chalk. The beds are usually thin, fragile, and almost schistose, whence the name of scaglia.

SCALE, a measure, consisting of a slip of wood, ivory, or metal, divided into equal parts, usually main divisions and subdivisions; as, inches or octonary fractions for carpenters' work, decimal divisions and subdivisions for chain work, duodecimal for plotting carpenters' work, which is in feet and inches. The meter and its decimal subdivisions are also sometimes employed. Also any instrument, figure, or scheme graduated for the purpose of measuring extent or proportions.

In music, the sounds in consecutive order used by various nations in different forms as the material of music. In a proper succession such sounds form melody, in proper combinations they constitute harmony. The modern scale, universally used among the more civilized nations, consists of 12 divisions, called semitones, included in one octave. The ancient Greeks and Asiatics, ancient and modern, exhibit the use of less intervals. Such scales are called enharmonic. Other nations have intervals of a third between some of the steps. This is exhibited in the Chinese and ancient Scotch scales, and in the scales of some savage nations. A scale containing only five unequal divisions of the octave has been called pentaphonic or, less correctly, pentatonic. All scales are purely arbitrary, consisting of a selection of sounds produced by the aliquot divisions of a monochord. When the divisions of a monochord are slightly altered to suit the required steps in an octave, as is the case in the modern scale, the scale is said to be tempered; when the harmonic divisions of the monochord are strictly followed, the scale is said to be in just intonation. The modern scale when used as a succession of 12 semitones is called chromatic, when used in the ordinary mixture of tones and semitones it is called diatonic, when the third and sixth are flattened it is called the modern minor diatonic scale, when the third and sixth remain major, the scale is said to be a major diatonic scale. The scale is also called the gamut (French, *gamme*) from the words *gamma* and *ut*, the names of sol and do, found in the Guidonian system of overlapping hexachords. The Italian names for the degrees of the scale, *ut, re, mi, fa, sol, la,* are derived from the initial syllables of

a Latin hymn quoted in all musical histories. *Ut* was afterward called *do* by many nations, and the name *si* was given to the seventh degree of the scale, when the ancient system of hexachords was converted into the modern system of octaves. When the scales, whatever the pitch, start from *do*, the system is said to be that of the movable *do;* when the first note of the scale is called *do, re, mi,* etc., according to a stated pitch called *do,* the system is called that of the fixed *do.*

In painting, a figure subdivided by lines like a ladder, which is used to measure proportions between pictures and the things represented. Scale of a series, in algebra, a succession of terms, by the aid of which any term of a recurring series may be found when a sufficient number of the preceding ones are given. Scale of longitudes; a scale used for determining geographically the number of miles in a degree of longitude in any latitude.

SCALE FERN, a popular name for a British species of fern (*Ceterach officinarum*), so named from the imbricated tawny scales at the back of the fronds. To this plant was formerly attributed a marvelous influence over the liver and spleen.

SCALE MOSS, a popular name given to the Jungermannias, plants resembling moss, and belonging to the order *Hepaticæ*. They grow on the trunks of trees, in damp earth, and in similar places, and are so called from the small scale-like leaves.

SCALE TREE, an important tree (*Lepidodendron*), fossil remains of which are found in the coal-measures, whose trunk was very regularly marked with ornamental patterns like the scales of some fishes. The height was 60 to 70 feet.

SCALENE, in mathematics, a term applied to a triangle whose sides are all unequal; also a cone such that a section made by a plane through the axis perpendicular to the plane of the base is a scalene triangle. In this latter case the term is equivalent to oblique.

SCALES, the imbricated plates on the exterior of certain animals, as the pangolins or scaly ant eaters, serpents and other reptiles, and especially fishes. Fishes are sometimes classed, in accordance with the structure of their scales, into Ctenoid, Ganoid, Cycloid, and Placoid. The term scale is applied also, in botany, to a small rudimentary or metamorphosed leaf scale-like in form and often in arrangement, constituting the covering of the leaf buds of the deciduous trees in cold climates, the involucrum of the *Compositæ*, the bracts of catkins, etc.

SCALES, ARCHIBALD HENDERSON, an American naval officer, born in Greensboro, N. C., in 1868. He graduated from the United States Naval Academy in 1887, and became an ensign in 1889. He saw service in Korea, where, in 1896, he assisted in protecting the life of the Emperor of Korea, who had sought refuge in the Russian Legation. During the Spanish-American War he served on the "Topeka." He was promoted to be commander in 1909, and captain in 1914. In 1916 he was appointed captain of the "Delaware," and took part in the operations of the Grand Fleet in the North Sea, following the entry of the United States into the World War. He commanded the Great Lakes Naval Training Station, and in 1919 was appointed superintendent of the United States Naval Academy.

SCALES OF NOTATION, methods of representing numbers of any magnitude by means of a few symbols. We ordinarily express numbers in terms of the first nine digit symbols and the symbol known as the cipher—*i. e.*, 10 in all. The number "ten" is then represented by 10, a combination of the "one" and cipher symbols, and so on in the familiar manner. Mathematically there is no reason why 10 should be chosen in preference to any other number as the radix of our common scale of notation. Its convenience arises from the way in which it suits our numeration or naming of numbers.

SCALIGER, JULIUS CÆSAR (originally DELLA SCALA), a celebrated Italian scholar; born near Lago di Garda, Italy, April 23, 1484. He went to France in 1526, and there practiced medicine. According to some scholars, "no one of the ancients could be placed above him, and the age in which he lived could not show his equal" in learning and talent. He published an "Oration against Erasmus" (1531), in reply to that scholar's "Ciceronianus"; "Poems" (1533-1574), in Latin, filling several volumes; "Comic Meters"; and a variety of dissertations and essays on classical subjects. He died in Agen, France, Oct. 21, 1558.

SCALLOP, a well-known bivalve, one of those with a single muscle closing the shell. The valves are fan-shaped, the left often more or less flat, the right more arched; both are marked with sinuous radiating ridges, to which the name *Pecten* (Latin, "a comb") refers. The hinge line is without teeth, and is extended laterally in two ears. The beautiful coloring of the shells is remarkable

even among bivalves. On the margins of the mantle there are hundreds of small sparkling eyes of different degrees of visual efficiency. The small finger-shaped foot is usually marked with bright orange or red color. The scallops are widely distributed in all seas, at depth of 3 to 40 fathoms. When young they are active and able to swim a little by rapidly opening and closing their valves, but as they grow older they become more sedentary. *P. Jacobæus*, a native of the Mediterranean, is the scallop shell which pilgrims were accustomed to wear in front of their hat in token of having visited the shrine of St. James at Compostella. *P. maximus*, found on many parts of the British coasts, is about six inches broad. About 180 living species are known, and over 400 are recorded as fossils from Carboniferous strata.

SCALP, the term employed to designate the outer covering of the skull or brain case. Except in the fact that hair in both sexes grows more luxuriantly on the scalp than elsewhere, the skin of the scalp differs only slightly from ordinary skin. Besides the skin the scalp is composed of the expanded tendon of the occipito-frontalis muscle, and of intermediate cellular tissue and blood vessels. Injuries of the scalp, however slight, must be watched with great caution, for they may be followed by erysipelas, or by inflammation and suppuration under the occipito-frontal muscle, or within the cranium, or by suppuration of the veins of the cranial bones, and general pyæmia that may easily prove fatal. If dressed antiseptically at an early stage the risk of such accidents is of course greatly diminished. Burns of the scalp are very liable to be followed by erysipelas and diffuse inflammation, but the brain is comparatively seldom affected in these cases. Tumors of the scalp are not uncommon.

SCALPER, a term applied in the United States to a man who buys railroad, theater, or steamship tickets at a discount from people unable to use them, and sells them again at an advance on the price he paid for them.

SCALPING, the act peculiar to North American Indian warfare, of partly cutting, partly tearing off a piece of the skin of the head, with the hair attached; whether the victim is alive or dead at the time does not affect the operation. The Indians, with whom scalps are the trophies of victory, have always left a long lock or tuft on the scalp as a challenge. Bounties have, in American history, more than once been offered for scalps: in 1724 £100 (about $500) was offered by Massachusetts for Indian scalps; in 1754, during the French and Indian War, a bounty was offered by the French for British scalps, and by the colonies for Indian scalps; in 1755 Massachusetts offered £40 (about $200) for every scalp of a male Indian over 12 years old, and £20 (about $100) for scalps of women and children.

SCAMANDER, a small stream in the Troad, in northwestern Asia Minor; associated with the little river Simois in the story of the Trojan War.

SCAMMONY, in botany, the scammony bindweed. In chemistry, scammonium, a purgative gum resin obtained from the root of *Convolvulus scammonia*. When the root is cut there exudes a milky juice, which dries up to a yellowish-brown, gummy-looking substance. Two varieties are known in commerce, Aleppo and Smyrna, the former being considered the more valuable. It forms flat irregular masses, very brittle, and having a dark gray or blackish hue. Viewed in thin fragments, it appears translucent and of a golden brown color. Genuine scammony should contain from 75 to 82 per cent. of resinous matter, soluble in alcohol, the remainder being wax, gum, starch, etc. It is, however, frequently adulterated. Pure scammony is a powerful drastic purgative and anthelmintic. Montpellier scammony is obtained from *Cynanchum mouspeliacum*.

SCANDERBEG (properly ISKANDERBEG, or PRINCE ALEXANDER), an Albanian chief whose real name was George Castriota; born in Croia, Albania, in 1403. He was the son of a Christian prince, but was brought up by the Turks and fought for some time for Amurath II. Becoming possessed of the chief city of his country, which the Turks had taken, he turned against them, abjured Mohammedanism, and raised the whole of Epirus in revolt. For 25 years he withstood all the efforts of the Turks to overcome him, defeating them in 22 battles, even when led by the Sultan. Shortly before he died, he was compelled to yield to superior forces. He died in Alessio, Albania, Jan. 17, 1468.

SCANDINAVIA, the ancient name of the region now comprehending the three kingdoms, Denmark, Sweden, and Norway, or Sweden and Norway alone, and still frequently used. These countries were inhabited in the earliest times by people of the Teutonic stock, and 100 B. C. the natives of Jutland and Schleswig became formidable to the Romans under the name of Cimbri. But it was chiefly in the 9th century that they made their power felt in western and south-

ern Europe, where hordes of Northmen, or Vikings, made repeated raids in their galleys. The Old Norse or Scandinavian literature, so far as extant, is of considerable value. Among the most important remains are the Edda and the Sagas. See NORTHMEN.

SCANDIUM, in chemistry, an element discovered by Nilson in 1879; symbol, Sc; at. wt. 44.91. It occurs, together with the other rare earths, in gadolinite and euxenite, but the metal itself has not yet been isolated. It forms one oxide, scandia or scandium oxide, Sc_2O_3, a white infusible powder, resembling magnesia, sp. gr. 3.8, insoluble in water and acids.

SCAPE, in architecture, the shaft of a column; also, the apophyge of a shaft; also, a botanical term for a flower stalk springing straight from the root, as in the primrose, snow-drop, etc.

SCAPE GOAT, a term applied to one who is made to bear the blame due to another. The idea is drawn from the Jewish ritual, in which a scape goat was a goat designed to 'scape, *i.e.*, escape, as opposed to one killed and offered in sacrifice. Once a year, on the great day of atonement, after Aaron had offered a bullock in sacrifice for the sins of himself and his house (Lev. xvi. 1-6), he was to take two goats "for a sin offering." Lots were to be cast, one for the Lord, and one for Azazel. The goat on which Jehovah's lot fell was to be offered for a sin offering.

Under the later Judaism the goat was thrown over a precipice about 12 miles from Jerusalem. The scape goat is generally considered the clearest type of the substitution of Christ for sinners, and His eternal removal of their transgression (Isaiah liii. 11-12; John i. Heb. ix. 28; I. Peter ii. 24).

SCAPULA, in anatomy, one of the two bones, the other being the clavicle, which together form the pectoral arch or shoulder girdle. The scapula constitutes its posterior part. It is placed upon the upper and back part of the thorax, is articulated with the outer end of the clavicle, and has suspended from it the humerus. In zoology, the row of plates in the cup of crinoids, giving origin to the arms.

SCAPULAR, or **SCAPULARY**, a dress originally worn over their other dress by the monks when at manual labor, but now forming part of the habit of the older religious orders; also a miniature copy of a monk's scapular made of two pieces of cloth, connected by strings, worn by Roman Catholics from motives of devotion. There are four other scapulars in use: that of the Trinity, of white linen with a red cross; the Servite scapular of the Seven Dolors, of black stuff; that of the Immaculate Conception, of light blue woolen, and the Red scapular, in commemoration of the Passion. In ornithology in the plural, a series of feathers springing from the base of the humerus, and continued in a longitudinal stripe so as to cover the last series of the quill feathers, with which they are often confounded. In surgery, a bandage for the shoulder blade.

SCARABÆUS, in entomology, a genus of *Coprinæ*, and the typical one of *Scarabæidæ*. The semicircular clypeus is divided by sharp notches into a series of triangular teeth; the forelegs are retracted. About 70 species are known, all from the Old World. *S. acer*, formerly *Ateuchus sacer*, is the sacred beetle of the Egyptians, often represented on Egyptian monuments, though Latreille thought it was *S. egyptiorum*, a golden green species. Both deposit their eggs in pellets of dung, which they roll with their hind legs into a hole dug for its reception.

SCARBOROUGH, a port and watering place in England, much resorted to for health and pleasure. It is in Yorkshire, on the east coast, 37 miles N. E. of York, and overlooks a crescent sweep of sands ornamented by a headland crowned by a castle. Two bridges spanning the Ramsdale valley connect the modern with the older part of the town. A promenade pier, spa and garden, aquarium, and facilities for bathing and boating are among the attractions. The industries include fisheries, the making of jet, and, in the suburbs, market gardening. The town was bombarded by German cruisers in December, 1914, and by a German submarine in September, 1917. Pop. about 40,000.

SCARLATINA. See SCARLET FEVER.

SCARLATTI, ALESSANDRO, an Italian composer, born in 1650, who was the founder of the Neapolitan school of music, in which most of the composers of the 18th century were trained. Scarlatti originated the overture. He is said to have written 200 masses, 100 operas, and 3,000 cantatas. His writings, though they produced a revolution in the style of operatic music, are almost all completely forgotten. He died in Naples, Oct. 24, 1725. His son DOMENICO (1683–1757) was considered the greatest harpsichord player (pianist) of his time.

SCARLET, a beautiful bright red color, brighter than crimson. The finest scarlet dye is obtained from cochineal.

SCARLET BEAN, or **SCARLET RUNNER**, a twining plant, the *Phaseolus multiflorus*, a native of Mexico, cultivated as a green vegetable or as an ornamental plant.

SCARLET FEVER, or **SCARLATINA**, a contagious febrile disease, almost always attended during a part of its course by a rash and by sore throat. Sometimes only one of these features is well marked, sometimes both. Though persons of all ages are susceptible to it, it is eminently a disease of children. It is infectious and contagion may be carried by clothing, school-books, etc. Like smallpox or measles it rarely attacks a person more than once. It usually comes on with shiverings and a feeling of lassitude, followed by more or less of fever, restlessness, loss of appetite, headache, nausea, and occasionally by vomiting. The eruption appears on the second or third day in the form of closely aggregated points about the size of a pin's head. The period of desquamation, owing to excessive production of new epidermis, follows in two or three days. The eruption may be on the face only, the most frequent change being in the throat, the tonsils becoming swollen with catarrhal pharyngitis, tenacious mucous secretion, and œdema, with great difficulty in swallowing. Inflammation of the parotids and other glands often occurs, with suppuration and abscess, destroying the cell tissues, with sloughing, and occasionally fatal hemorrhage.

Physicians have generally distinguished three different varieties of scarlet fever; viz., *S. simplex*, in which there is a florid rash and little or no affection of the throat; *S. anginosa*, in which both the skin and the throat are decidedly implicated; and *S. maligna*, in which the stress of the disease falls on the throat. *S. simplex* is a very mild form of the disease, and deviates only slightly from a state of health. Scarlatina is also dangerous from its tendency to give rise to other complaints, as boils or strumous ulcers, various forms of scrofula, etc. The kidneys are more affected in this disease than any other organ, nephritis being a common accompaniment, and dropsy a very frequent sequel. It is very contagious, the infection persisting for a long time, and tending to attack every member of a family not protected by a previous attack. Its regular course is from two to three weeks, the period of infection being strongest during the process of desquamation, and lasting for about three weeks from the commencement of that process. It is most fatal in the very young, during pregnancy, or in adults suffering from organic diseases, or when complications exist. There is no known specific for this formidable malady.

SCARLET FISH, a name given to the telescope carp, from its brilliant red color.

SCARLET TANAGER, in ornithology, the *Pyranga rubra*, a summer visitant to the United States, retiring S. in winter. The popular name is derived from the prevailing hue of the summer plumage of the male.

SCARR, JAMES HENRY, an American meteorologist, born in Ionia co., Mich., in 1867. From 1887 to 1889 he was a student at the State Normal School at Emporia, Kan. For a time he studied law, and from 1889 to 1895 was engaged in teaching in the public schools. He was admitted to the bar in 1892 and practiced law until 1898, when he entered the employment of the United States Weather Bureau. He was local forecaster at Sacramento, Cal., from 1901 to 1908; at Tampa, Fla., in 1908-9; and in New York City since 1909.

SCARRON, PAUL (Skär-rôn*g*′), a French author; born in Paris about 1610. At the age of 30, in consequence of a rheumatic attack, in which he was treated

PAUL SCARRON

by a quack doctor, he became an invalid for life,—deformed and contorted, and suffering continual pain. His best work is the "Comic Romance" (2 vols. 1651-1657, but never completed), the story of a band of strolling actors. In this novel Scarron draws on Spanish sources, as he does also in the comedies "The Ridiculous Heir"; "Jodelet"; "Don Japhet of Ar-

menia"; "The Scholar of Salamanca." His travesty of the Æneid (1648-1653) was in its day regarded as a masterpiece of genuine burlesque humor. He married in 1652, Françoise d'Aubigné, who afterward, as Mme. de Maintenon, became the wife of Louis XIV. He died in Paris, Oct. 14, 1660.

SCENIC AND HISTORIC PRESERVATION SOCIETY, American, a national organization having for its purpose the protection of American scenery. The society was incorporated by the legislature of New York in 1895 and since that date has succeeded in safeguarding many valuable landmarks in the United States. Among other things it brought about the purchase of the New York State park at Stony Point as well as of Washington's Headquarters in New York City. It was through the activity of the society that a state reservation was brought into existence at Watkins Glen, and that laws were passed to protect Niagara. It has charge also of landmarks and historic places such as Philipse Manor Hall.

SCHAFF (shaf), **PHILIP**, an American clergyman; born in Coire, Switzerland, Jan. 1, 1819. He studied at Tübingen, Halle, and Berlin; lectured in the latter university in 1842-1844, and then went to America, where he was professor in the theological seminary of the German Reformed Church at Mercerburg, Pa. (1844-1863). In 1864-1869 he was lecturer in several theological institutions, and after 1870 was Professor of Sacred Literature in Union Theological Seminary, New York. He was a prolific writer, his works including: "History of the Apostolic Church"; "Life and Labors of St. Augustine"; "America"; "Germany"; "Through Bible Lands"; "History of the Christian Church"; "Creeds of Christendom"; "Religious Encyclopedia" (as editor), etc. He was president of the American Committee on Bible Revision in 1871. He died in New York City, Oct. 20, 1893.

SCHAFFHAUSEN, capital of the Swiss canton of the same name, on the Rhine, 25 miles N. W. of Constance, and 23 miles from Zurich. It is a place of antiquity, and has a large parish church, an academy, town library, town hall, and market house. The manufactures are machinery, iron and steel products, textiles, yarns, watches, etc. The wine raised in the neighborhood is exported. Two bridges here, thrown across the Rhine, form a channel of communication between this town and the rest of Switzerland. The Falls of Schaffhausen form a cataract of the Rhine, 3 miles from the town, with a descent of about 100 feet. It is one of the most striking waterfalls in Europe.

SCHAMYL (*i. e.*, Samuel), chief of the Lesghians and leader of the independent tribes in the Caucasus in their 30 years' struggle against Russia; born in Aul-Himry, northern Daghestan in 1797. He became a priest or mollah, and labored with zeal and religious fervor to compose the numerous feuds of the Caucasian tribes and unite them in antagonism to their common enemy, the infidel Russians. He was one of the foremost in the defense of Himry against the Russians in 1831. In the end of 1834 he was elected "imam," or head of the Lesghians, and soon made himself absolute temporal and spiritual chief of the tribes of Daghestan. He at the same time introduced a change of military tactics, abandoning open warfare for surprises, ambuscades, etc., which brought numerous, and sometimes great, successes to the arms of the mountaineers. In 1839 the Russians succeeded in hemming Schamyl into Achulgo in Daghestan, took the fortress by storm, and put every one of the defenders to the sword in order to be quite certain that Schamyl should not escape. But by some mysterious means he did escape, and suddenly appeared preaching with more vigor than ever the "holy war against the infidels." Ten years later he again escaped from the same stronghold after the Russians had made themselves masters of it. The Russians were completely baffled, their armies sometimes disastrously beaten by their unconquerable foe, though he began to lose ground through the long continuance of the struggle and the exhaustion it naturally brought with it. During the Crimean War he was helped by the allies, who supplied him with money and arms; but after peace was signed the Russians resumed their attacks on the Caucasian tribes with more energy, opened a road over the mountains, thus cutting off one portion of the patriots, and so compelled their submission. On April 12, 1859, Schamyl's chief stronghold, Weden, was taken after a seven weeks' siege, and his authority, except over a small band of personal followers, was wholly destroyed. For several months he was hunted from fastness to fastness, till at last (Sept. 6, 1859) he was surprised on the plateau of Gounib, and after a desperate resistance, in which his 400 followers were reduced to 47, he was captured. He was assigned a residence at Kaluga in the middle of Russia, with a pension of $5,000, and he died in Medina, Arabia, in March, 1871, having taken up his residence in Mecca the year previously. In faith he was a Sufi.

SCHARNHORST, GERHARD JOHANN DAVID VON, a Prussian military officer; born in Bordenau, Hanover, Nov. 12, 1756. He entered the army of Hanover, and took part in the campaigns in Flanders of the years 1793-1795. In 1801 he transferred his services to Prussia and was appointed director of the training school for Prussian officers. Five years later he was wounded at Auerstädt and taken prisoner at Lübeck, but released in time to be present at the battle of Eylau. In 1807 he began the great work of his life; he was put at the head of the commission for reorganizing the armies of Prussia. He reformed the army, introduced the short service (Krümper) system, created a better spirit among both officers and men, and so converted what had been a mercenary force into a national army. It was principally by means of this new weapon that Germany was able to crush Napoleon at Leipsic six years later (1813). Scharnhorst was wounded at Grossgorschen while acting as chief of the staff of the Silesian army, and died in Prague, Bohemia, June 28, 1813.

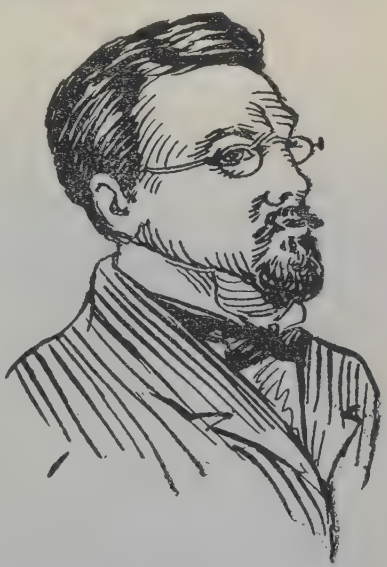
SCHAUFFLER, ROBERT HAVEN, an American writer and musician, born at Brünn, Austria, in 1879, of American parents. He graduated from Princeton in 1902, and took post-graduate studies at the University of Berlin, where he also studied music. He was musical editor of several magazines, and contributed on musical subjects to many periodicals. During the World War he served as regimental intelligence officer for the 313th Infantry, and was severely wounded in the Meuse-Argonne offensive. His published writings include "Where Speech Ends" (1906); "Romantic Germany" (1909); "Scum o' the Earth and Other Poems" (1912) "Romantic America" (1913); "The Joyful Heart" (1915).

SCHAUMBURG-LIPPE, a former principality of the German Empire, proclaimed a republic in November, 1918. Area, 131 square miles. In the north it is hilly and well wooded. The principal article of manufacture is linen. In the south agriculture and gardening are the chief industries, while coal is mined in the east. Pop., about 47,000, all of whom, with the exception of some 750 Catholics and some 250 Jews, are Protestant. The capital is Bückeburg (pop. about 6,000). Previous to November, 1918, the country was ruled by a cadet branch of the Lippe family. The state became a principality in 1807, joined the North German Confederation in 1866, and became a part of the German Empire in 1871.

SCHEELITE, native calcium tungstate, $CaWO_4$, an important ore of tungsten. Occurs as a pale-colored, stony looking mineral. Owing to its unusual heaviness it was given the name *tungsten* by the Swedes, meaning "heavy stone." The name was later used to describe the metal when it was discovered in 1781 by K. W. Scheele, while the ore itself was given the name scheelerz or scheelite.

SCHEFF, FRITZI, an Austro-American prima donna, born in Vienna, Austria, in 1882. She received her musical education at Frankfort, Germany, and appeared on the operatic stage for the first time at the Munich Opera House, in 1900. In 1902 she made her first appearance at the Metropolitan Opera House, New York, remaining a member of its company under the management of Maurice Grau, from 1900 to 1903. In the latter year she appeared in New York for the first time in a musical comedy, to which work she devoted herself until 1913. From 1913 to 1918 she appeared principally in vaudeville, returning in the latter year to the musical opera stage in "Glorianna." She was married three times; first to Baron von Bardeleben of the German army, second to John Fox, Jr. (*q. v.*), and third to George Anderson, an actor.

SCHEFFEL, JOSEPH VICTOR VON (shef'el), a German author; born in Karlsruhe, Germany, Feb. 16, 1826. In



JOSEPH VICTOR VON SCHEFFEL

1854 he published his famous epic poem, "The Trumpeter of Säckingen." The historical novel "Ekkehard" came out in

1855. "Gaudeamus" (1868) is a collection of lyrics, many of which became favorite student songs. "Mountain Psalms" (1870) is a collection of poems. He died April 9, 1886.

SCHEFFER, ARY, a French painter, son of Johann Baptist (a German historical painter); born in Dordrecht, Holland, Feb. 12, 1795; studied under Guérin in Paris, and began his artistic career as a painter of genre pictures. Under the influence of the romanticism of the early 19th century he produced numerous pieces illustrative of Goethe's, Byron's, and Dante's works, such as "Margaret at the Well," "Faust in His Study," and "Dante and Beatrice in Heaven." Shortly after 1835 he turned to religious subjects, and painted "Christus Remunerator," "Christus Consolator," "The Temptation of Christ," "St. Augustine and Monica," etc. His best portraits were of the Duchess de Broglie, Prince Talleyrand, Queen Amélie, Liszt, La Fayette, Béranger, and Lamartine. He died in Argenteuil, near Paris, June 15, 1858.

SCHELDT (skĕlt; *Dutch*, Schelde—shel'-duh), one of the most important rivers of Belgium and the Netherlands. It rises in the French department of the Aisne; flows circuitously through Belgium; reaches Ghent, where it receives the Lys; at Antwerp attains a breadth of about 1,600 feet, and forms a capacious and secure harbor. About 15 miles below Antwerp, shortly after reaching the Dutch frontier, it divides into the East and West Scheldt, thus forming a double estuary. The whole course is 267 miles, about 210 of which are navigable. Until 1863, when navigation was made free by the Treaty of Brussels, the Dutch monopolized it and levied tolls on foreign vessels. As a result of the World War and the Peace Treaty of Versailles, control of the Scheldt became again a subject of controversy between Holland and Belgium.

SCHELLENBERG, a village 9 miles S. of Salzburg, Austria; was the scene of the first engagement in the War of the Spanish Succession in which the English took part. Marlborough's army of 40,000 men drove a Bavarian corps of 12,000 from the fortified heights above the village, after a short, fierce fight, on July 4, 1704.

SCHELLING, FRIEDRICH WILHELM JOSEPH VON, a German philosopher; born in Leonberg, Württemberg, Jan. 27, 1775. He studied first at Tübingen, where he and Hegel became intimate friends, thence he went to Leipsic and Jena. At Jena he studied under Fichte, whom he succeeded in the chair of philosophy at that university in 1798. In 1803 he was transferred to Wurzburg; and in 1807 to Munich, where he remained till 1841, when he accepted a chair at Berlin. This chair he soon relinquished, and the last years of his life were spent in comparative seclusion. Schelling's place in the great series of German philosophers is determined to be between Fichte and Hegel. His metaphysical theory is generally known by the name of the "System of Identity." He died in Ragatz, Switzerland, Aug. 20, 1854.

SCHENECTADY, a city and county-seat of Schenectady co., N. Y., on the State Barge canal, the Mohawk river, and the New York Central and Hudson River, and the Delaware and Hudson railroads; 17 miles W. of Albany. Here are UNION COLLEGE (*q. v.*), Home for the Friendless, Children's Home, public library, Ellis Hospital, court house, State armory, city hall, waterworks, street railroad and electric light plants, numerous churches, National, State, and savings banks, and a number of daily, weekly, and monthly periodicals. The city has manufactories of agricultural implements and machinery, copper and sheet iron, shawls, knit goods, underwear, stoves, steel springs, varnish, sashes, doors, and blinds, electrical apparatus, fire engines, locomotives, pumps, carriages, brushes and brooms, flour, etc., and an assessed property valuation exceeding $142,000,000. Schenectady is one of the oldest cities in New York State. It was settled in 1661; was burned and nearly all the inhabitants massacred by the French and Indians in 1690; and was the scene of a second massacre in 1748. It received a city charter in 1798. Pop. (1910) 72,826; (1920) 88,723.

SCHERER, JAMES AUGUSTIN BROWN, an American educator, born in Salisbury, N. C., in 1870. He graduated from Roanoke College in 1890. In 1892 he founded the American Lutheran mission in Japan, and from 1892 to 1897 was professor of English at the Imperial Government School at Japan. Returning to the United States he served as pastor in Charleston, S. C., from 1898 to 1904. In the latter year he was elected president of Newberry College, serving until 1908, when he became president of the Throop College of Technology. He was a member of the Council of National Defense during the World War, a member of many economic and learned societies, and carried on important investigations on the question of immigration. He wrote "Four Princes" (1902); "Japan To-Day" (1904); "What Is Japanese Morality?" (1906); "Cotton as a World

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A VIEW OF SALT LAKE CITY, UTAH, SHOWING MAIN STREET, WITH THE WASATCH MOUNTAINS IN THE BACKGROUND

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THE MORMON TEMPLE AND THE TABERNACLE, SALT LAKE CITY, UTAH

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SANTIAGO DE CUBA, AND A TROPICAL STORM READY TO BREAK

©*British and Colonial Press*

A VIEW OF ST. JOHN, NEW BRUNSWICK, CANADA

©*Colonial Press Service*

LAYING A GAS BUOY IN THE ST. LAWRENCE RIVER. THE BUOY IS ANCHORED WITH A HEAVY CONCRETE BLOCK

© *Underwood & Underwood*

ORE STEAMERS ON THE SAULT STE. MARIE. THEY CARRY IRON ORE BETWEEN MINNESOTA PORTS AND OTHER PORTS OF THE GREAT LAKES

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LAKE WASHINGTON CANAL, WHICH CONNECTS LAKE WASHINGTON WITH THE HARBOR OF SEATTLE

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THE SHEEP HERD ON A RANCH NEAR SILVERTON, COLO.

Power" (1912); and "The Nation at War" (1918).

SCHEVENINGEN (skā'veningen), a watering-place of Holland, on the W. coast, 1 mile N. W. of The Hague, with which it is connected by two roads; one, the "Oude Weg" ("Old Road") of the 17th century, bordered by fine trees. Both this and the New Road are traversed by tramways. The town is visited during the season by over 20,000 persons; its beach is one of the finest on the North Sea. In 1570 the W. part of the town was engulfed by an inundation. A naval battle, between the Dutch, under Von Tromp (who was killed in the engagement), and the allied fleets of France and England, was fought off Scheveningen in 1673. Pop. about 22,000.

SCHIAPARELLI (skē-ä-pā-rel'le), **GIOVANNI VIRGINIO**, an Italian astronomer; born in Savigliano, Italy, March 5, 1835; educated at the University of Turin and the observatories of Berlin and Pulkowa. In 1860 he became astronomer at the Milan observatory, and in 1862 its director. He discovered the planet Hesperia in 1861. He was one of the first to discover the connection between comets and meteor streams, and is the discoverer of the double canals bearing his name on Mars. Among his works are: "The Relation Between Comets and Falling Stars" (1871); "The Precursors of Copernicus in Antiquity" (1873); "Observations on the Movement of Rotation and the Topography of the Planet Mars" (1878-1886). He died July 5, 1910.

SCHIEDAM (skē-dam'), a town of South Holland, Netherlands, on the Schie river. Along the site of the walls stand corn and malt mills. The chief edifices and institutions are the town hall, the exchange (the finest building in the town), the Doelen, or gathering place, the Musis Sacrum, a concert hall, the churches, Latin, drawing, commercial, and other schools, a public library, numerous hospitals and other benevolent institutions. The industries include the manufacture of white lead and litharge, linen weaving, flax spinning, copper and iron castings. It is noted for its production of gin and other liquors. Schiedam has a considerable commerce in grain and coals. Pop. (1918) 38,191.

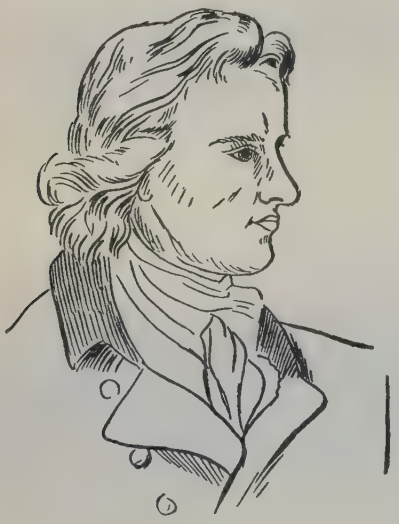
SCHIFF, JACOB HENRY, an American financier and philanthropist, born at Frankfort-on-the-Main, Germany, in 1847. He was educated in the schools of Frankfort-on-the-Main, and in 1865 he moved to the United States, where, after having achieved success in the banking business, he organized the firm of Kuhn, Loeb & Co., which became one of the most important financial institutions in the United States and financed many important enterprises, especially the construction of railroads. Mr. Schiff later became a director of many large financial and industrial companies. His work as a philanthropist was done chiefly in connection with Jewish organizations, but

JACOB H. SCHIFF

he also gave liberally to other causes. He was vice-president and trustee of the Baron de Hirsch Fund, a director of the New York Foundation of the National Employment Exchange, and a vice-president of the New York Chamber of Commerce. He was the founder of the Jewish Theological Seminary in New York, and of the Semitic Museum at Harvard. He also contributed $100,000 for a Technical College at Hafia, Palestine. He was actively concerned with the improvement of civic conditions in New York, and was a leading member of the "Committee of 70," which secured the overthrow of the Tweed Ring. He did much toward the development of Jewish enterprises in Palestine and other countries. He died in 1920.

SCHILLER, JOHANN CHRISTOPH FRIEDRICH VON, a German poet; born in Marbach, Württemberg, Nov. 10, 1759. After having studied medicine and

become surgeon in a regiment, he, in his 22d year, wrote the tragedy of "The Robbers," which at once raised him to the foremost rank among the dramatists of his country. It was performed at Mannheim in 1782. But some passages of a revolutionary tendency having incurred the displeasure of the Duke of Württemberg, Schiller left Stuttgart by stealth and made his way to Mannheim, where, after various wanderings and many hardships, he got his tragedy of "Fiesco" brought out on the stage. The tragedies of "Cabal and Love," and "Don Carlos," were his next productions. In 1785 he went to Leipsic and Dresden, where he found many admirers. Here he wrote his singular romance called "The Ghost-



JOHANN CHRISTOPH F. VON SCHILLER

seer" and his "Philosophical Letters," and collected materials for a "History of the Revolt of the Netherlands Under Philip II." In 1787 he repaired to Weimar, where he was welcomed with great warmth by Weiland and Herder, undertook the management of a periodical called the "German Mercury," and not long afterward made the acquaintance of Goethe, which soon ripened into a friendship only dissolved by death. In 1789 he was appointed to the chair of history in the University of Jena, and besides lecturing to crowded audiences he published his "History of the Thirty Years' War" and engaged in various literary enterprises which had great influence on the literature of Germany. A periodical called "The Hours" and the "Almanac of the Muses," to which the most eminent men in Germany contributed, belong to this period. He also produced the "Xenian," a collection of epigrams, and wrote his "Ballads," which are reckoned among the finest compositions of their kind in any language. About 1790 he exhibited a strong tendency to consumption, which, by precluding him from lecturing, greatly reduced his income. The Prince of Denmark settled on him a pension of $1,000 for three years, and thus enabled him to pursue his studies. He soon after settled at Weimar, in order to direct the theater in conjunction with Goethe; and here at intervals he published the following works: "Wallenstein," "Mary Stuart," "Joan of Arc," and "William Tell." He died in Weimar, Germany, May 9, 1805.

SCHINNER, AUGUSTIN FRANCIS, an American Roman Catholic bishop, born in Milwaukee, Wis., in 1863. He was educated at St. Francis Seminary, and was ordained priest in 1886. After serving for one year as a pastor, he was a member of the faculty of St. Francis Seminary from 1887 to 1893. From 1893 to 1905 he was chancellor and vicar general of the archdiocese of Milwaukee. He was consecrated first bishop of Superior, Wis., in 1905, but resigned in 1913, and in the following year was appointed first bishop of Spokane.

SCHLANGENBAD (shlang'en-bat), a watering-place of Prussia, in Hesse-Nassau, 6 miles W. N. W. of Wiesbaden, among wooded hills. The water has a temperature of from 80° to 88°, and is beneficial in hysteria, neuralgia, rheumatism, gout, paralysis, etc.

SCHLEGEL, AUGUST WILHELM VON (schlā'gel), German author, born in Hanover, Prussia, Sept. 8, 1767. He was Professor of Literature in the University of Bonn. His most notable works in literary and art criticism are: "Lectures on Dramatic Art and Literature" (3 vols. 1809-1811), translated into nearly all the languages of western Europe; "On the Theory and History of the Plastic Arts" (1827). In the field of Orientalism he wrote "Reflections on the Study of the Asiatic Languages" (1832), and prepared editions of several Indian classics. He translated many of the plays of Shakespeare and made the English dramatist a German classic. He translated Dante, Calderon, Camoens, and other foreign masters of literature. He wrote sonnets, an elegy, "Rome" (1812), and other poems. He died in Bonn, Germany, May 12, 1845.

SCHLEGEL, FRIEDRICH VON, a German philologist, born in Hanover, Prussia, March 10, 1772. He first devoted himself to the study of Greek antiquity, and in 1794 published his great

essay "On the Schools of Grecian Poetry"; following it with many others of a like tenor, as "The Greeks and Romans" (1797), and "History of Greek and Roman Poetry" (1798). In his "Fragments" (1798-1800) he essayed to establish the theory of a new romanticism; in the meantime writing the unfinished romance "Lucinda," and a volume of "Poems." He wrote also a tragedy, "Alarcos." His work "Language and Wisdom of the Indians" (1808) was a valuable contribution to the science of language. Among his other writings are lectures on "Modern History" (1811); "History of Ancient and Modern Literature" (1815); "Philosophy of Life." He died in Dresden, Saxony, Jan. 12, 1829.

SCHLESWIG, or SLESWICK, formerly a duchy of Denmark; bounded N. by Jutland, from which it is nearly separated by the Konge Aa river and the Kolding fiord. Prussia took possession of it in 1867 with Holstein, and the two duchies formed the province of Schleswig-Holstein. By a plebiscite, provided for by the Treaty of Versailles, north Schleswig in 1920 decided to join with Denmark, while south Schleswig adhered to Prussia. Area, 7,299 square miles. Pop. about 1,750,000.

SCHLESWIG or SLESWICK, a seaport of Prussia, in the province of Schleswig-Holstein; situated on the W. end of the Schlei, a narrow inlet of the Baltic Sea; 70 miles N. W. of Hamburg. It was an important port and seat of trade as early as 800. It contains a church founded in 850, the ducal castle of Gottorp, a fine cathedral, and deaf and dumb and lunatic asylums. Among the manufactures are lace, woolen goods, earthenware, leather, and sugar. Seven annual fairs are held here. In April, 1848, Schleswig was occupied in turn by the Danes and the Allies; in July, 1850, was regained by the Danes; in February, 1864, was occupied by the Austrians; and in 1867 came into possession of Prussia. Pop. about 20,000.

SCHLETTSTADT, or SCHLESTADT, a town of Alsace-Lorraine; 27 miles S. W. of Strasburg. It was made a free city under the Hohenstaufen. In 1634 it was taken by the French, and was fortified by Vauban, 1676; ceded to the Germans, 1870; and the fortress destroyed by them, 1874. Here was discovered, in the 13th century, the art of glazing pottery. It is the birthplace of the reformer, Martin Bucer, 1491. It has manufactories of leather, gloves, cottons, linens, chemicals, beer, spirits, oil, and other commodities. Pop. about 10,000.

SCHLEY (slī), WINFIELD SCOTT, an American naval officer; born in Frederick co., Md., Oct. 9, 1839. He entered the United States Naval Academy in 1854, served with distinction in the Civil War; was present at the bombardment of Valparaiso and Callao by the Spanish fleet, and during the same cruise he suppressed insurrections at both Middle Chincha Island and La Union, Honduras. He served on the East India and China stations for several years, and in 1871

REAR-ADMIRAL WINFIELD SCOTT SCHLEY

took part in the attack on the Korean fortifications on the Salee river by leading the assaulting column. He commanded the expedition which rescued Greely from Cape Sabine in 1884. When a war with Spain was anticipated, Commodore Schley was on March 25, 1898, placed in command of the "Flying Squadron" at Hampton Roads, comprising the armored cruiser "Brooklyn," and the battleships "Massachusetts" and "Texas." On May 13, under sealed orders, he steamed out to sea, presumably for the purpose of intercepting and destroying the Spanish fleet under Admiral Cervera. Commodore Schley divined the probable course the Spanish admiral would take, and on May 28 arrived off the harbor of Santiago de Cuba, in which the Spanish fleet had taken refuge, and by blockading the entrance prevented its escape. His squadron was united with Rear-Admiral

Sampson's fleet on June 30, and on July 3 the combined fleets, under the personal direction of Commodore Schley, attacked and totally destroyed the Spanish fleet while endeavoring to escape from the harbor. In August, 1898, he was promoted rear-admiral. Owing to the absence of Rear-Admiral Sampson, Schley's ranking officer, from the actual battle of Santiago, a controversy arose between the friends of the two officers as to whom the credit for the victory belonged. Schley, having been accused of discreditable actions, asked for the appointment of a court of inquiry which convened Sept. 12, 1901, Admiral Dewey presiding. The majority report found Schley guilty of vacillation, lack of enterprise, and disobedience; while Dewey's report praised Schley for efficient service, and gave him the credit for the destruction of Cervera's fleet. Schley filed with the Secretary of the Navy objections to the majority report, but it was nevertheless approved by Secretary Long, Dec. 20, 1901. The President when appealed to, also approved the findings of the court. He died in New York City, N. Y., Oct. 2, 1911.

SCHMALKALDEN, LEAGUE OF, a defensive alliance concluded at Schmalkalden, April 4, 1531, between nine Protestant princes and 11 imperial cities, with whom other princes and imperial cities subsequently made common cause. The Elector of Saxony and the Landgrave of Hesse were appointed chiefs of the league. The object of this formidable alliance, which included nearly all the Protestant States from Denmark to Switzerland, was the common defense of the religion and political freedom of the Protestants against the Emperor Charles V. and the Catholic states. The confederation was consolidated by the "Articles of Schmalkalden," drawn up by Luther at Wittenberg in 1536. A conflict was of course inevitable. In the war of Schmalkalden that ensued (1546), when the emperor got leisure to turn his attention to the matter, the strength of the Protestants was crippled and dissipated by jealousies, but especially by the defection of Duke Maurice of Saxony, so that in the battle of Mühlberg (April 24, 1547) the Elector of Saxony (the head of the elder branch of the Saxon house, Duke Maurice being the head of the younger branch), Philip of Hesse, and other Protestant chiefs were taken prisoners and their army routed. This caused the league to break up. The Protestant cause was, however, revived five years later by Duke Maurice, who had in the meantime been made elector instead of his unfortunate kinsman, and who, in 1552, returned to his old allegiance to Luther's teaching.

SCHMALKALDEN, an old town of Hesse-Nassau, Prussia; 19 miles S. W. of Gotha; surrounded with double walls; contains a castle, a town hall, in which the historic "articles" were signed; and carries on iron mining and hardware manufactures. It is the birthplace of Karl Wilhelm (1815-1873), composer of the music of "The Watch on the Rhine."

SCHNEIDEMÜHL, a town in Prussia, Germany. It is situated in the province of Posen, 153 miles by railway N. E. of Berlin. It is a well-built town, with some interesting churches, a seminary for priests, hospitals and deaf and dumb asylum. The industries include glass-making. Pop. about 27,500.

SCHNITZER, EDWARD, better known as EMIN PASHA, an African explorer; born in Oppeln, Germany, March 28, 1840. Studying medicine, he graduated in 1864. Proceeding to Turkey, he practiced his profession. He adopted the name of Emin, and Turkish habits and customs, entering the Egyptian medical service as Dr. Emin Effendi. In 1878 he was appointed by Gordon Pasha governor of the Equatorial Province. He showed himself an enlightened ruler and a bitter foe to slavery. He added greatly to the anthropological knowledge of central Africa and published valuable geographical papers. He entered the German service, 1889, and commanded an expedition to central Africa; made treaties with the Arabs of Tabora, and founded three large German stations on Victoria Lake; established a chain of military posts from Mpwapwa to the interior; in 1891 pressed onward into the heart of central Africa, and in 1892 S. toward the equator. He was murdered by Arab slave traders in the Kongo Free State, Oct. 20, 1892.

SCHNITZLER, ARTHUR, an Austrian dramatist and short-story writer, born in Vienna, in 1862. He was educated in his native city and in 1885 received the degree of M.D. from the University of Vienna. He practiced medicine until 1893, when he published with great success, "Anatole," a sequence of seven one-act dramas of modern life in Vienna. These, as well as later creations of his, have been played successfully, not only on Austrian and German stages, but also in many other countries, including the United States. Among his other dramatic works were "Der Grüne Kakadu" (1899); "Paracelsus" (1899); "Lebendige Stunden" (1902); "Der Einsame Weg" (1904); "Der Ruf des Lebens" (1905); "Comptess Mizzi" (1909); "Das Weite Land" (1911); "Professor Bernhardi" (1913); etc. Among his fictional

works should be mentioned: "Sterben" (1895); "Der Weg ins Freie" (1908); etc. A collection of his writings were published in seven volumes in Berlin, in 1912.

SCHOFIELD, JOHN M'ALLISTER, an American military officer; born in Gerry, N. Y., Sept. 29, 1831; was graduated at the United States Military Academy in 1853; served on garrison duty in South Carolina and Florida in 1853-1855; was assistant Professor of Philosophy at the United States Military Academy in 1855-1860, and Professor of Physics in Washington University, St. Louis, Mo., in 1860-1861. During the Civil War he served in the Missouri campaign under General Lyon; commanded the Department of the Ohio; took part in the Atlanta campaign; and commanded at the battle of Franklin, Tenn., Nov. 30, 1864, for which he was made Brigadier-General and brevet Major-General in the regular army. After the war he became commander of the Division of the Pacific; was Secretary of War in 1868-1869; commanded the army of the United States as senior Major-General; and was promoted Lieutenant-General in 1895. He was the author of "Forty-six Years in the Army" (1897). He died March 4, 1906.

SCHOFIELD, W(ALTER) ELMER, an American painter, born at Philadelphia, Pa., in 1867. He studied in Paris under Bouguereau, Ferrier, and Aman-Jean and, returning to America, became a Fellow of the Pennsylvania Academy of Fine Arts, Philadelphia. He is represented in the National Collection of Uraguay; Corcoran Art Gallery, Washington; John Herron Art Gallery, Indianapolis; Art Museum, Cincinnati; Pennsylvania Academy Fine Arts; Carnegie Institute, Pittsburgh; Sebright Art Gallery, Buffalo; Memorial Gallery, Washington; International Exposition, Buenos Ayres, and other permanent collections. He received many prizes and gold medals and was a member of the National Academy, National Institute of Art and Letters, the Royal Society of British Artists, etc. During the World War he saw service with the British army in France.

SCHOLARSHIP, a name given in the universities of Oxford and Cambridge, England, to foundations for maintaining scholars. A scholarship is, like a fellowship, subject to certain regulations and conditions; is inferior to the latter, but superior to an exhibition. In the United States most of the colleges have endowed scholarships.

SCHOLASTICISM, in philosophy and Church history, the name given to a movement which began with the opening of cloister schools by Charlemagne (742-814), attained its greatest development in the early part of the 13th century under Aquinas and Scotus, and, after receiving a check from the labors of Roger Bacon (1214-1292) and the criticism of Occam (died 1347), gradually subsided at the Renaissance. Scholasticism was the reproduction of ancient philosophy under the control of ecclesiastical discipline, the former being accommodated to the latter in case of any discrepancy between them. It had two chief periods: In the first period arose the Nominalists and the Realists; in the second the Scotists and the Thomists.

SCHOMBURGK, SIR ROBERT HERMANN, a Prussian traveler; born in Freiburg, Prussian Saxony, June 5, 1804. He was trained for the mercantile profession and came to the United States in 1829; but in the following year he removed to Anegada, one of the Virgin Isles. Having surveyed the island and laid a report before the Royal Geographical Society, he was charged by that body to lead an exploring expedition to British Guiana in 1835. This enterprise he successfully achieved. It was during this exploration, and while he was ascending the Berbice river, that he discovered, Jan. 1, 1837, the magnificent aquatic plant, the "Victoria Regia," described in his "Description of British Guiana" (Lond. 1840), and his "Views in the Interior of Guiana" (1841). In 1840 he returned to Guiana to survey the colony for the government, and to draw the long controverted "Schomburgk line" as a provisional boundary with Venezuela and Brazil, and was knighted. In 1847 he published an excellent and elaborate "History of Barbadoes," and in the following year he was appointed British consul at Santo Domingo, and in 1857 British representative at the Siamese court. Ill-health forced him to return to Europe in 1864 and he died at Schöneberg, near Berlin.

SCHÖNHAUSEN, a village of Prussia, province of Saxony, and district of Magdeburg; 2 miles from the Elbe river; is the birthplace of Prince Bismarck (1815), and is noted as the location of his family estates.

SCHÖNBERG, or MÄHRISCH-SCHÖNBERG, a town of Czecho-Slovakia. It is situated on the river Tess, 159 miles S. E. of Prague. The surroundings are picturesque. It is well built, with a fine church, agricultural and weaving schools, and textile industries. Pop. (district) about 85,000.

SCHONBERG, a suburb of Berlin, Germany. It is largely given over to

residences of business people working in Berlin and has an aërial navigation bureau of the German army, with hospital for the insane and an observatory. The industries include military supplies, photographic materials, paper, railway locomotives. Pop. about 175,000.

SCHOODIC LAKES, a chain of lakes in Maine, forming a part of the boundary between the state and the province of New Brunswick. The two larger lakes are Grand and First. The outlet of the chain is Schoodic river, which flows into the St. Croix river about 50 miles from its mouth; length, 25 miles.

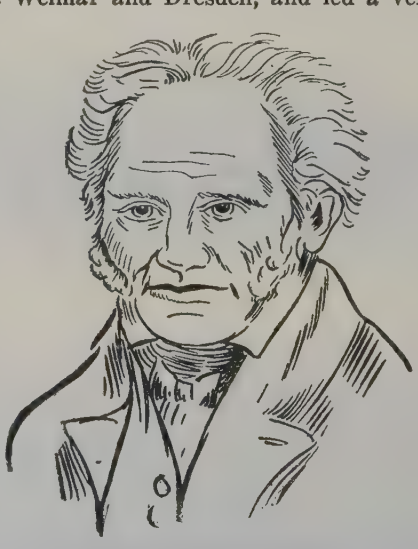
SCHOOLCRAFT, HENRY ROWE, an American author, noted as an Indian authority; born in Albany co., N. Y., March 28, 1793. Thirty years of his life he spent among the Indians, and through him many laws were enacted for their protection. Among his numerous publications are: "Travels in the Central Portions of the Mississippi Valley" (1825); "Indian Melodies," a poem (1830); "The Man of Bronze" (1834); "Algic Researches," a book of Indian allegories and legends (1839); and "The Indian and His Wigwam" (1848). He died in Washington, D. C., Dec. 10, 1864.

SCHOOL. See COMMON SCHOOLS, SECONDARY SCHOOLS, TECHNICAL EDUCATION, etc.

SCHOOLS, MEDICAL INSPECTION OF, a function which has been taken up by municipal and state governments only within recent years. As has been shown by statistics, many pupils are backward in their studies only because of lack of physical vitality. In 1920 it was shown that so many pupils in the schools of Brooklyn, N. Y., were compelled to pass through the same grades twice that, at the average cost of forty dollars a term for each pupil, the borough lost $2,000,000. On this basis various social organizations demanded an appropriation from the city of $100,000 for more effective medical aid to the school-children, contending that more than half of the extra expense could thus be saved. Medical school inspection was first instituted in France in 1886; then, in succession, this example was followed by Belgium, Hungary, Chile, Germany and Great Britain, the latter in 1908. In this country it was first instituted in New York City, in 1892; then in Boston, in 1894; in Chicago, in 1895, and in Philadelphia, in 1898. Practically every American city now has adopted medical inspection and several states have made it obligatory in all schools. In the larger communities this includes the services of visiting nurses, who instruct the children in personal hygiene. Out of 252,000 school-children inspected in New York City, in 1919, 74 per cent were found defective physically, defective teeth and vision being the chief faults.

SCHOONER, a two or three-masted vessel whose sails are of the fore-and-aft class—*i. e.*, extended on booms. The masts have but one splice, the topgallant, if any, forming part of the topmast stick. When a schooner has none but fore-and-aft sails, she is termed a fore-and-aft schooner; if carrying a square foretopsail and fore-topgallant sail, a topsail schooner. This latter rig, formerly common, has now become rare. Square-rigged vessels have also lower fore-and-aft sails, denominated spencers or trysails, but these are small and are brailed up to the gaff when furled, instead of being lowered like those of a schooner.

SCHOPENHAUER, ARTHUR, a German philosopher; born in Danzic, Feb. 22, 1788; son of Johanna Schopenhauer, the popular novelist and littérateur. He studied at Göttingen, attended the lectures of Fichte at Berlin, spent some time at Weimar and Dresden, and led a very



ARTHUR SCHOPENHAUER

restless life till 1831, when he settled at Frankfort-on-the-Main. He despised his countrymen and their philosophies, and studied French and English literature and latterly Oriental religions. He became an enthusiast for Buddha and the Vedas, and enjoyed tracing all Western accomplishments to Eastern sources. The principal work of Schopenhauer is en-

titled "The World as Will and Idea." It appeared in 1819, and after being neglected for many years attracted a good deal of attention and received some sharp criticism. The practical upshot of his system, which makes will the one sole reality, is intolerable melancholy, taking from man all that constitutes his greatness, his goodness, or his bliss. God—futurity—the soul—mere names, illusions; and the world of men is to him hopelessly bad. The style is brilliant; but the general effect of the work on the average mind is depressing. He published several other works of philosophy, of which the most important is "The Two Sound Problems of Ethics." He died in Frankfort-on-the-Main, Sept. 21, 1860.

SCHOULER, JAMES, an American lawyer; born in Arlington, Mass., March 20, 1839; was graduated at Harvard University in 1859; admitted to practice at the Massachusetts bar in 1862; and in the Supreme Court of the United States in 1867; became Professor of Law in Boston University and lecturer at Johns Hopkins University. He published "The Law of Domestic Relations"; "The Law of Bailments"; "The Law of Personal Property"; "Law of Wills"; "Americans of '76" (1906); and "Ideals of the Republic" (1908).

SCHREINER, OLIVE, a South African novelist; born in Basutoland, 1863. She is the daughter of a Lutheran minister, and was married in 1890 to Mr. Cronwright, an Englishman of the colony. She published her first and most noted book, "The Story of an African Farm," under the pseudonym "Ralph Iron," at the age of 20; "Dreams" (1890); "Dream Life and Real Life" (1893); "Trooper Peter Halket" (1897); "An English South African's View of the Situation" (1899); "Women and Labour" (1911); etc. She died in 1920.

SCHREMBS, JOSEPH, an American Roman Catholic bishop, born at Ratisbon, Bavaria, in 1866. He removed to the United States in 1877 and was educated at St. Vincent's College, Pa., at the Grand Seminary, Montreal, and at Laval University. He was ordained to the priesthood in 1889 and served as pastor in several churches in Michigan. In 1902 he was appointed vicar general of the diocese of Grand Rapids. He was consecrated bishop of Grand Rapids in 1911, and in the same year became bishop of the diocese of Toledo, Ohio.

SCHROEDER, SEATON, an American naval officer, born at Washington, in 1849. He graduated from the United States Naval Academy in 1868 and in the following year was appointed ensign. From 1868 to 1872 he served on the "Saginaw," "Pensacola," and "Benicia." He took part in the Rodgers' expedition against the Korean forts, in 1871. He served in various capacities on shore and at sea and was advanced three times in rank for eminent and conspicuous conduct in the Spanish-American War. In 1899-1900 he was on duty at the Navy Yard at Washington, and from 1900 to 1903 he was naval governor of the Island of Guam. From 1909 to 1911 he was commander-in-chief of the Atlantic fleet. In the latter year he was retired, but continued on special duty in the Navy Department for three years. He wrote "Fall of Maximilian's Empire" (1887) and many contributions to magazines.

SCHUBERT, FRANZ PETER, an Austrian composer; born in Vienna, Austria, Jan. 31, 1797. He belonged to a family distinguished for their musical talents, and from his earliest years showed a strong bent to musical studies and composition. At seven years of age he was the pupil of Michael Holzer; became a chorister in the imperial chapel, and the pupil of the court organist and of Salieri. He studied the works of Haydn, Mozart, and Beethoven, and gave lessons in music for a living. The number and variety of his compositions is extraordinary. The most admired is his "Songs," and among them "The Erl King," and "Ave Maria" are perhaps the best known. But he wrote also operas, sonatas, symphonies, overtures, cantatas, six masses, etc. He left numerous works unpublished at the time of his death. Schubert spent almost his whole life at Vienna, and died there Nov. 19, 1828.

SCHULER, ANTHONY J., an American Roman Catholic bishop, born in St. Marys, Pa., in 1869. He was educated at St. Stanislaus Seminary, at St. Louis University, and at Woodstock College. In 1886 he joined the Society of Jesus, and was ordained priest in 1901. For several years he was on the faculty of the Sacred Heart College of Denver, and from 1907 to 1910 he was engaged in parish work at El Paso, Tex. He was consecrated bishop of El Paso in 1915.

SCHUMANN-HEINK, ERNESTINE, an American prima donna, born near Prague, Bohemia, in 1861. She was educated at a convent in her native city, and made her first operatic appearance as a contralto at the Dresden Court Opera, in 1878. Later she appeared in Hamburg and Berlin, and finally at Bayreuth, where she acquired an international repu-

tation. Eventually she came to the United States and became a member of the Metropolitan Opera Company, N. Y.,

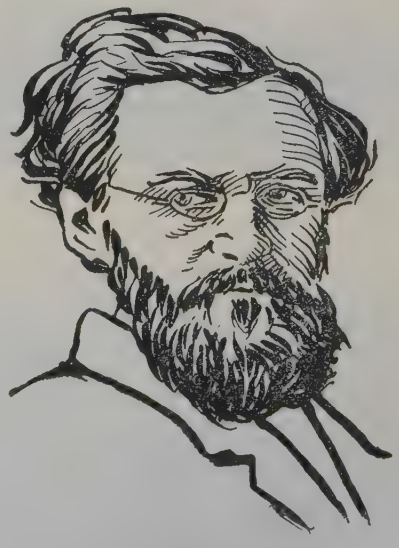
MADAME ERNESTINE SCHUMANN-HEINK

for several seasons, after which she appeared regularly both on the operatic and on the concert stage throughout the United States.

SCHUMANN, ROBERT, a German musical composer; born in Zwickau in the kingdom of Saxony, June 8, 1810. He studied law at Leipsic, but in 1830 finally devoted himself to music under the tuition of Friedrich Wieck and Heinrich Dorn. The daughter of the former, the celebrated pianiste, Clara Wieck (born 1819), became his wife in 1840. In 1834 he commenced his "A New Musical Periodical," a journal which was to herald an ideal music, and which, for the 10 years of his more intimate connection with it, exercised an important influence on the development of the art not incomparable with that of Lessing's "Hamburg Dramaturgy" in drama. Prior to 1840 his principal works were the "Fantasias," the "Scenes of Childhood," the "Etudes Symphoniques," the "Kreisleriana," the "Abegg" variations, the "Papillons," the "Carnival," and two sonatas in F sharp minor and G minor. In the year following his marriage he published nearly 150 songs, many on Heine's words. He then commenced his great series of orchestral works, his symphony in B flat being first performed at the close of 1841. It was followed by his "Overture Scherzo and Finale," his D minor symphony, three quartets, the piano quintet and quartet, the cantata "Paradise" and the "Peri," the C major symphony (1846), "Genevieve" (1847); "Manfred" (1848); the Faust music (1850), the E flat symphony (1851), and other works. Under stress of work, however, his reason failed him, and after an attempt to drown himself in 1854 he was confined in a lunatic asylum, where he died July 29, 1856.

SCHURMAN, JACOB GOULD, an American educator; born in Freetown, Prince Edward Island, May 22, 1854. He won the Gilchrist Dominion scholarship, 1875; was graduated at London University, 1877; was Professor of Philosophy in Acadia College, 1880-1882; in Dalhousie College, Halifax, 1882-1886. He became Professor of Philosophy at Cornell University and president in 1892, serving until 1920. In 1899 he was appointed president of the first Philippine Commission. He was minister to Greece and Montenegro in 1912-13. He has published: "Kantian Ethics" (1881); "The Ethical Import of Darwinism" (1887); "Agnosticism and Religion"; "A Generation of Cornell" (1898); "Report of the Philippine Commission"; "The Balkan Wars" (1912-13); "Why America Is in the War" (1917). He was also editor of the "Philosophical Review."

SCHURZ, CARL, an American statesman; born in Liblar, near Cologne, Prussia, March 2, 1829; he was a student at



CARL SCHURZ

Bonn in 1847-1848. In the early part of 1849 he participated in the revolutionary movements in the Palatinate and at Baden, and on the defeat of the insurrection fled to Switzerland to escape arrest.

About 1852 he came to the United States, and settled in Madison, Wis. He soon identified himself with the Republican party. He advocated the election of Frémont in 1856 by public speeches in the German language. He afterward made political speeches in English, and achieved a high reputation as an orator. In 1860 he addressed the people of various States advocating the election of Abraham Lincoln. In 1861 he was appointed minister to Spain, but when the Civil War broke out he resigned that he might return and join the Union army. He took part in the second battle of Bull Run, and commanded a division at Chancellorsville, May, 1863, and a corps at Gettysburg, July 1-3 of that year. He resigned from the army in 1865, and in 1866 became editor of the Detroit "Post." In 1868 he went to St. Louis, and in 1869 was elected United States Senator from Missouri. He supported Mr. Greeley for President in 1872, and Mr. Hayes in 1876, and was Secretary of the Interior, under the latter, from 1877 to 1881. In 1881-1884 he was editor of the New York "Evening Post," and was conspicuous in the "Mugwump" movement of 1884. In 1892 he became president of the National Civil Service Reform League. He afterward wrote several books, among them a "Life of Henry Clay." He died May 14, 1906.

SCHUSTER, ARTHUR, a British scientist, born at Frankfort-on-the-Main, in 1851. He was educated at Frankfort-on-the-Main, Geneva, Owens College, Manchester, and Heidelberg. He was chief of the "Eclipse" expedition to Siam, 1875. In 1892 he was president of Section A of the British Association and later became president of the Manchester Literary and Philosophical Society, and of the Physical Society, London. He received the Royal medal of the Royal Society in 1893 and became president of the British Association in 1915. His works include "Theory of Optics"; "Progress of Physics"; "Britain's Heritage of Science."

SCHUSTER, SIR FELIX, a British financier, born in 1854. He was educated at Frankfort-on-the-Main, Geneva, and Owens College, Manchester; and then went into business in London. He was on the Royal Commission on London Traffic, 1903-5; Board of Trade Commission for the Amendment of Company Law, 1905; India Office Committee on Indian Railway Finance and Administration, 1907-8; and Treasury Committee on Irish Land Purchase Finance, 1907-8. He was chairman of the Council of the Institute of Bankers, 1908-9, and of the Central Association of Bankers, 1913-15. His works include: "Foreign Trade and the Money Market"; "Our Gold Reserves."

SCHÜTT, two islands in the river Danube. They are situated in Hungary, partly in the districts of Komorn and Pressburg. GREAT SCHÜTT ISLAND is 58 miles long and from 10 to 20 miles wide, and is fertile, being called the Golden Garden of Hungary. LITTLE SCHÜTT ISLAND is 28 miles long. The Danube borders the former on the south and the latter on the north.

SCHUYLER, MONTGOMERY, an American diplomat, born at Stamford, Conn., in 1877. He graduated from Columbia University in 1899 and took postgraduate studies at that university. He was appointed second secretary of the American Embassy at Petrograd in 1902, and in 1904 served as secretary of legation and consul-general at Bangkok, Siam. He served as chargé and first secretary to Rumania, Servia, Russia, Japan, and Mexico. In 1913 he was appointed minister to Ecuador. In 1914-15 he served as special agent of the United States to Russia. In 1918 he was commissioned a captain in the Officers' Reserve Corps, and served in the Ordnance Department. In 1918-19 he was chief intelligence officer in Siberia. In 1919 he was discharged with the rank of major. He was a member of many historical societies and contributed articles on Oriental and literary subjects to various periodicals.

SCHUYLER, PHILIP, an American military officer; born in Albany, N. Y., in November, 1733. He served in the war against the French and Indians in 1756. In June, 1775, he was commissioned commander of an army in New York with the rank of Major-General. He was about to move the army into Canada, but he was taken sick, and was succeeded in September by General Montgomery. He was appointed delegate to the Continental Congress later in the same year, and was again a delegate in 1777. In the latter year also he commanded the Continental forces against General Burgoyne, but was superseded by General Gates, in consequence of the jealousy with which Congress regarded him. His conduct was vindicated by a court of inquiry. Later he rendered important services in military affairs, but he declined to take command of an army. He was a member of the Congress in 1778, and while holding that post resigned from the army in 1779, remaining in Congress till 1781. He was Federalist United States Senator from New York in 1789-1791, and was again elected a Senator, in place of Aaron Burr, in 1797. One of his daughters was the wife of Alexander Hamilton. He died in Albany, Nov. 18, 1804.

SCHUYLER LAKE, a small lake in Otsego co., N. Y. Its outlet is the Susquehanna river. It is about 8 miles N. W. of Cooperstown and is 24 miles S. E. of Utica; length 5 miles.

SCHUYLKILL, a river of Pennsylvania, which rises in the N. side of the Blue Mountains, runs S. E., passes through the confines of Philadelphia, and unites with the Delaware 5 miles below that city. It is 120 miles long.

SCHUYLKILL HAVEN, a borough of Pennsylvania, in Schuylkill co., on the Schuylkill river, and on the Pennsylvania, the Philadelphia and Reading, and the Lehigh Valley railroads. Its industries include car shops, underwear and shoe factories, rolling mills, and pip mills. Pop. (1910) 4,747; (1920) 5,437.

SCHWAB, CHARLES M., an American capitalist and public official, born at Williamsburg, Pa., in 1862. While still a boy he entered the employment of the Carnegie Company as a stake driver. He attracted the attention of the officials of the company by his efficiency and was gradually promoted until he became in 1881 chief engineer. He was soon afterward appointed assistant manager and from 1889 to 1897 was general superintendent of the Edgar Thompson Steel Works. During the same period he was also superintendent and general superintendent of the Homestead Steel Works. From 1897 to 1901 he was president of the Carnegie Steel Company, Ltd., having become one of the most trusted lieutenants of Andrew Carnegie. He persuaded the latter to accept the plans made by J. P. Morgan for the formation of the United States Steel Corporation and on the formation of that organization was elected its president. He resigned in 1903 and became president of the Bethlehem Steel Corporation, which was built up under his management, until it became one of the largest steel making enterprises in the world. During the first years of the World War his company had a virtual monopoly in contracts to supply the Allies with certain kinds of munitions. Mr. Schwab made many visits to Europe in connection with the manufacture and supply of munitions to the Allied governments, during this period. When the United States Government undertook the construction of ships in 1918 and formed the Emergency Fleet Corporation, Mr. Schwab was appointed director-general of shipbuilding, and largely through his efforts the problem of the replacing of ships destroyed by submarines was solved. He served until December, 1918. Mr. Schwab established an industrial school at Homestead, Pa.; gave an auditorium to the Pennsylvania State College; founded a home for children on Staten Island, N. Y.; and gave to his native town, Loretta, Pa., a Catholic church costing $150,000. He was one of the most valuable advisers of the government during the reconstruction period following the World War.

SCHWAN, THEODORE, an American soldier, born at Hanover, Germany, in 1841. He was educated in Germany and removed to the United States in 1857. He served during the Civil War, rising to the rank of 1st lieutenant. At the close of the war he enlisted in the Regular Army and was appointed captain. He was promoted to various grades, becoming lieutenant-colonel in 1895, and brigadier-general of volunteers in 1898. In the following year he was honorably discharged from the volunteer service, and in 1901 was appointed brigadier-general in the United States Army. After 40 years of service he retired at his own request in 1909. He was awarded a medal of honor for distinguished service in the Civil War. During the Spanish-American War, he commanded the 1st Division of the 9th Army Corps, and was chief of staff of the Division of Porto Rico. He saw service also in military expeditions in the Philippines. In 1916 he was promoted to be major-general in the United States Army.

SCHWARTZ, BERTHOLD, a monk of the order of Cordeliers, at the end of the 13th century, was a native of Freiburg, in Germany, and an able chemist. It is said that as he was making some experiments with niter he was led to his invention of gunpowder, which was first applied to warlike purposes by the Venetians in 1300. There is, however, much discrepancy in the accounts of this discovery; and it is certain that Roger Bacon, who died in 1292, was acquainted with an inflammable composition similar to gunpowder, the knowledge of which the Europeans appear to have derived from the Orientals.

SCHWARZBURG-RUDOLSTADT, a former German principality, now part of the Republic of Thuringia in the German Republic, situated between Prussian Saxony, the Saxon duchies, and the principality of Reuss. It lies on the N. side of the Thuringian Forest, and has an area of 362 square miles. The surface is rugged, and the soil by no means fertile. The most important crop is flax, the culture of which is almost universal. A great part of the land is devoted to pasture, and great numbers of cattle are reared. The minerals include brown coal, iron, slate, and salt. The principal

manufactures are glass and porcelain. The inhabitants are mostly Lutherans. The capital is Rudolstadt. Pop. about 100,000.

SCHWARZBURG-SONDERSHAUSEN, a former German principality on the N. side of the Thuringian Forest, between the territories of Prussian Saxony and the Saxon duchies, since 1919 a part of the Republic of Thuringia, a state in the German Republic; area, 333 square miles. It is more fertile than Schwarzburg-Rudolstadt, producing corn for export. One of the principal sources of revenue is derived from the forests, which furnish excellent timber. Flax also is extensively cultivated, and great numbers of cattle, sheep, and swine are reared. The only manufacture of any importance is porcelain. The inhabitants are almost all Lutherans. The capital is Sondershausen. Pop. about 90,000.

SCHWARZENBERG, a princely family of Germany, the head of which was raised (1429) by the Emperor Sigismund to the dignity of Baron of the Empire. Three of this family have acquired a European reputation. ADAM, Count of Schwarzenberg, born in 1584, became (1619) prime minister and adviser of George William, Elector of Brandenburg. He was all powerful during the Thirty Years' War, and brought down terrible calamities on Brandenburg by his obstinate refusal to join the Protestant union and his firm adherence to a policy of neutrality. He died in prison, 1641, shortly after the death of his master. KARL PHILIPP, Prince of Schwarzenberg; born in Vienna, April 15, 1771, and first served against the Turks. In the war against the French republic he fought with especial honor at the battles of Cateau-Cambresis (1794), Würzburg (1796), and Hohenlinden (1800), and reached the grade of lieutenant field marshal. He was under the orders of Mack in the campaign of 1805; and when he saw that Ulm was lost he cut his way through the French army and retired to Eger. He was ambassador at the Russian court in 1808 by the express wish of the Emperor Alexander, fought at Wagram in 1809, and conducted the negotiations for the marriage between Napoleon and Maria Louisa. In this capacity and as ambassador at Paris he so far gained the esteem of Napoleon that the latter expressly demanded him as General-in-Chief of the Austrian contingent which was sent to aid France in the invasion of Russia in 1812. Schwarzenberg passed the Bug and achieved some slight successes, but was driven into the "duchy of Warsaw," where, acting on secret instructions from Napoleon, he took up a position at Pultusk and remained inactive. In the following year he was appointed to the command of the Austrian army of observation in Bohemia; and, when Austria joined the allied powers he became generalissimo of the united armies and won the great battles of Dresden and Leipsic. The year after (1814) he marched into France and captured Paris. He died of apoplexy in Leipsic, Oct. 15, 1820. His nephew, FELIX LUDWIG JOHANN FRIEDRICH, born Oct. 2, 1800, was sent on a diplomatic mission to London in 1826, was ambassador at Naples in 1846, distinguished himself in the Italian campaign of 1848, was placed at the head of affairs at Vienna, called in the aid of the Russians against Hungary, and pursued a bold absolutist policy, his object being to make Austria supreme among the German states. He died in Vienna, April 5, 1852.

SCHWATKA, FREDERICK, an American Arctic explorer; born in Galena, Ill., Sept. 29, 1849; was graduated at the United States Military Academy in 1871, and served as a lieutenant of cavalry on the frontier till 1877, meanwhile being also admitted to the Nebraska bar and taking a medical degree in New York. In 1878–1880 he commanded an expedition to King William's Land which discovered and buried the skeletons of several of Sir John Franklin's party, and gathered information which filled up all gaps in the narratives of Rae and McClintock, besides performing a notable sledge journey of 3,251 miles. After exploring the course of the Yukon in Alaska, in 1885 he resigned his commission. In 1886 he commanded the New York "Times" Alaskan expedition, and ascended Mount St. Elias to a height of 7,200 feet; in 1891 he led another party to Alaska which opened up some 700 miles of new country in the same quarter; and in 1889 he led an expedition, for the journal "America," into Chihuahua, in northern Mexico. He published "Along Alaska's Great River" (1885); "Nimrod in the North" (1885); "The Children of the Cold" (1886); etc. He died in Portland, Ore., Nov. 2, 1892.

SCHWEIDNITZ, a town of Prussia, in Silesia, on a height above the Weistritz, 29 miles S. W. of Breslau. Its manufactures include machinery, woolens, linens, furniture, earthenware, carriages, gloves, beer, and spirits. It was made a regular fortress by Frederick the Great, and figured much during his wars. During its last siege, in 1807, it was taken in 36 days by the French and its outworks were dismantled. Its fortifi-

cations were removed in 1862. Pop. about 35,000.

SCHWEINFURT, an ancient and long an imperial free city in Bavaria; on the Main, 28 miles N. E. of Würzburg. It contains a beautiful market-place, in which important cattle and wool markets are held. Wine growing, sugar refining, and manufactures of chemicals, paper, bells, dyeing materials, as white lead, ultramarine, Schweinfurt green, etc., and numerous other articles are carried on. Rückert, the poet, was born here; and a monument was erected in 1890. Pop. about 22,200.

SCHWENKFELD, CASPAR VON, a German reformer; born of noble family, in Ossig, Lower Silesia, in 1490; studied two years at Cologne and elsewhere, and, before retiring into private life in 1521 to a constant study of the Scriptures, served at various courts with Duke Charles of Münsterberg, and as aulic counsellor with Duke Frederick II. of Liegnitz. About 1525 he openly declared for Luther, and went to Wittenberg to converse with him, but found his views widely divergent on baptism and the eucharist. Still further, he found himself unable to accept any confessions of faith except such as followed closely the letter of Scripture. Schwenkfeld did not himself partake of the Lord's Supper, though he did not forbid it to others. He did not approve of infant baptism, yet without admitting the Baptist view of the importance of the baptism of adults.

Schwenkfeld's view brought him the hatred of the Lutherans and Catholics alike. The influence of the Emperor Ferdinand forced the Duke of Liegnitz to banish him in 1529, and he thereafter traveled to Ulm, Augsburg, Nuremberg, and Strasburg, everywhere gaining disciples. Luther fiercely denounced him, and many untrue charges were brought against him by others. He died in Ulm, Dec. 10, 1561. Schwenkfeld wrote 90 distinct works, most of which were burned by Protestants and Catholics. By means of personal teaching and his books a group of earnest disciples more than 4,000 strong was formed all over Germany, but mostly in Swabia and Silesia, under the name of Confessors, or Followers of the Glory of Christ. They were persecuted in Silesia in his lifetime, and many emigrated to Holland, some to England. The Jesuit mission established in Silesia in 1719 persecuted the remnant still further, and some joined the Protestant churches, some fled to Saxony, where they were protected by Count Zinzendorf. In 1734 40 families emigrated to England, and finally thence to Pennsylvania, where, as Schwenkfeldians, they have maintained a distinct existence to this day.

SCHWERIN, the capital of the republic of Mecklenburg-Schwerin, Germany. It is situated on Lake Schwerin, 38 miles S. E. of Lubeck. It has many handsome buildings, among them a fourteenth century Gothic cathedral, containing the ducal tombs, and the former Grand Ducal Palace. The manufactures are machinery, dyes, pianos, bricks, and furniture. Pop. about 45,000.

SCHWERTE, a town of the province of Westphalia, Prussia. It stands 53 miles N. E. of Cologne, and has some interesting buildings, among them a Romanesque church with carved interior and ancient stained-glass windows. The industries include iron wares and machinery. Pop. about 14,000.

SCHWYZ, a central canton of Switzerland, bounded on the N. by the Lake of Zürich and canton of St. Gall, W. by Zug and Lucerne, S. by Lake Lucerne, and E. by Glarus; area, 351 square miles. It belongs to the so-called mountain cantons, being traversed in all directions by lofty peaks, including the Mythen, the Rigi, the Rossberg, the Drusberg, etc. The whole canton belongs to the basin of the Rhine, more than two-thirds of the surface being drained by the Sihl and the Lake of Zürich; a third, by the Lake of Lucerne, chiefly by means of the Muota; and the remainder, forming only an unimportant portion, by the Lake of Zug. The chief industry is the rearing of cattle, sheep, and swine. The canton is very poor in minerals. Manufactures are almost confined to some cotton and silk spinning and weaving. Schwyz being the most important of the cantons which first threw off the yoke of Austria, gave the name to the whole confederation. Its present government is an extreme democracy, the whole power, legislative and executive, being lodged in the male population of legal age, who hold a general assembly every two years. The great body of the inhabitants are Roman Catholics. Pop. (1920) 59,475. Schwyz, the capital, is a straggling and picturesque town at the foot of the Mythen, about 1,680 feet above the sea, with a handsome parish church and an interesting town hall. Pop. about 8,000.

SCIACCA, a seaport of Sicily; on a cliff 30 miles N. W. of Girgenti; has a fine 11th-century cathedral, the ruined castles of the Lunas and the Perollos (between whom there existed a terrible feud), hot sulphurous and saline springs,

and half-way up the adjacent mountain San Calogero caves that have been used as steam baths since Phœnician times. Off the coast very productive coral banks were discovered in 1875–1880. Agathocles, tyrant of Syracuse, was a native. Pop. about 25,000.

SCIATICA, acute pain produced by neuralgia following the course of the great sciatic nerve, generally in only one limb. It extends from the sciatic notch down the posterior surface of the thigh to the popliteal space, or even to the foot, and arises from pressure on the nerve by intestinal accumulations, or from tumors, inflammation, over-fatigue, exposure to cold and wet, or rheumatism. There are often nocturnal exacerbations of pains. It is most common from 50 to 60 years of age, and may continue for weeks or months. Electricity has been successfully employed.

SCIDMORE, ELIZA RUHAMAH, an American writer, born at Madison, Wis., in 1856. She was educated privately and for many years served as foreign secretary of the National Geographic Society. Her writings include "Guide to Alaska and the Northwest Coast" (1890); "Java, the Garden of the East" (1897); "China, the Long-Lived Empire" (1900); and "As The Hague Ordains" (1907).

SCIENCE, in its widest significance the correlation of all knowledge. To know a truth in its relation to other truths is to know it scientifically. For example, the recognition that the alternation of day and night depends on the apparent daily motion of the sun is a distinct scientific achievement, being one of those elementary scientific truths which have been the possession of thinking minds from time immemorial.

The end of science is the rational interpretation of the facts of existence as disclosed to us by our faculties and senses.

The scientific method is essentially inductive, *i. e.*, from particulars to generalities, and is to be contrasted with the method of philosophy which is deductive, *i. e.*, from general truths to particular truths. This distinction was first clearly indicated by Francis Bacon and elaborated by Descartes and Comte. No better instance of pure and extensive and scientific research can be cited than that pursued by Darwin in his biological investigations.

Experiment is the great aid to scientific inquiry. In it we arbitrarily interfere with the circumstances of a phenomenon, or produce an entirely new phenomenon by an appropriate combination of causes. Contrasted with experiment is observation, in which we simply watch and record the events as they occur in nature. But even in astronomy, emphatically an observational science, experiment plays an important part. The dynamical knowledge which Newton developed into the cosmic law of gravitation was founded on experiment; and every time the astronomer points his telescope to a celestial object he experiments by arbitrarily interfering with the course of the rays of light. Meteorology again, which 20 years ago could hardly be called a science, has made great strides in these days by appealing to laboratory experiments for the elucidation of its phenomena.

Sciences may be grouped, or science partitioned, on a broad and intelligible principle. There are the physical sciences, which have to do with inorganic nature—*i. e.*, with the laws and properties of matter, energy, and ether. Then there are the biological sciences, which consider the laws of life. And finally there are the psychical sciences, which deal with the phenomena of mind.

Numerous attempts have been made to give a detailed classification of the sciences, so as to bring out the natural relation of the one to the other. One of the most celebrated is the classification due to Comte, who first explicitly drew the distinction between abstract and concrete sciences, or what might better be termed fundamental and derivative sciences (see POSITIVISM). From the present outlook of science the existences of the universe are five—namely, ether, matter, energy, life, and mind. The first three are inseparable agents in the simplest phenomenon that occurs in nature. They may ultimately be reduced to two or conceivably to one.

SCIENTIFIC MANAGEMENT refers to the administration of industrial and other organizations according to methods based on laws deduced from facts accumulated by systematic observation. Its aims are many, among the most important being the elimination of wasted effort, increased output, the utilization of the special qualifications of every worker with a resultant improvement in both quality and quantity of product and greater contentment of the worker. The science may be said to be still in its infancy, as it has received serious consideration only since the latter party of last century.

It seeks to eliminate unnecessary effort by analyzing the movements made in performing any operation. It applies this analysis not only to human beings, but also to machinery or groups of machinery. By examining each motion separately, and then in its relation to the

sequence of motions which result in the complete operation, it discovers those motions which are unnecessary and in this way is able to build up a system of operation which accomplishes the necessary work with the smallest loss of time and effort.

The advocates of scientific management are strong believers in specialization. They work on the theory that every man is fitted to accomplish one particular task better than any other; that because he can do it better, he will be happier in doing it; and that because he is happy in his work it will be done with the greatest possible efficiency and the least amount of friction. It follows from this that it is a fundamental of scientific management to seek out the special qualifications of every individual worker, and by training, teaching and encouragement to foster his individuality. The critics of the science protest that while such a system may be theoretically desirable, it is a practical impossibility. It is stated, however, that wherever it has been tried by those who have made a real study of it and have properly understood its principles, it has never been given up.

As a necessary part of the development of each worker's individuality, more responsibility is placed upon him than is usual under the older system. In fact, Taylor, one of the leading exponents of the science of management, states that there should be an almost equal division of both work and responsibility between management and workman. He specifies, however, that this responsibility should be clearly defined—in other words, that every worker should know and understand the exact nature of the task he is expected to perform and that such conditions should exist that the daily work can always be accomplished. He advocates high pay as a reward for successful work with accompanying low pay in case of failure, thereby apparently coming in sharp conflict with the advocates of a uniform wage. He considers hearty co-operation between management and men a necessity for the successful working of the system.

In its details of organization, scientific management differs from the older type, in that it seeks to get away from the military idea of management, which has a single man at the head and a number of subordinates beneath him in a descending order of power, each man being responsible to the one above him and in command of all those below him. Just as it aims to develop the special talents of each individual worker, so it makes use of the special qualifications of each individual in the executive staff, and divides the responsibility among a group of specialists, each in charge of a department, and each, in his own department, of equal authority to the rest. A sharp division is first made between planning and performing. Five specialists control each division. On the planning side there is first the superintendent, whose task is to choose and advise the other specialists, and to see that the right man is in charge of each department. Then comes the Order of Work and Route Man, who organizes the order in which work is done, and the route through the factory which an article follows in the course of manufacture. Thirdly, there is the Instruction Card man, whose duty it is to see that each workman is trained in his particular job, and to organize educational work to that end. Next comes the Time and Cost Clerk, who keeps records of time and money spent on each manufacturing process and so assists in checking waste and promoting efficiency. Finally, there is the Disciplinarian, who studies, as it were, the psychological side of factory life, investigates the causes of dissatisfaction among the workers, or of jealousy among the executives, who smoothes out trouble and seeks to make the work run evenly and without friction. In the Performing Department there is the Gang Boss or, as some prefer to call him, the Instructor. In co-operation with the Instruction Card man he trains the workers in their tasks, brings out the individual talents in each man and so enables him to attain his highest possible productive efficiency. Next is the Speed Boss, who controls the machinery of production, and takes care that the manufacturing process runs at the speed of maximum efficiency. Thirdly comes the Repair Boss, whose duty it is to keep the machines in working order so that there is a minimum loss of time due to breakdowns. Next, is the Inspector of Quality, who passes on the quality of the goods produced, and finally there is the Individual Workman.

The supporters of such a system of Scientific Management claim for it that it increases output, decreases cost of production, raises wages, eliminates waste, and leads to a spirit of contentment and co-operation among the workers. Its opponents scoff at it as Utopian and unworkable. An intermediate opinion would probably be nearest the truth. As stated in the early part of this article, the science is still more or less in the experimental stage. Many of the details have still to be tried out, probably some unnecessary matter will be eliminated, and much will be added. It will be found that many, if not most, large industries, today, display in their working a mixture of both the older and the newer scheme

The need for some improvement in the old rule-of-thumb methods is generally recognized, and industry undoubtedly owes a debt to those who have studied the subject from the scientific viewpoint. In some cases it has been quick to adopt and profit by their suggestions, and even in the most conservative factories, it will be found that many of their ideas have permeated, to the general benefit.

SCILLY ISLANDS, a group of islands belonging to Cornwall, England; 25 miles W. S. W. of Land's End. They occupy about 30 square miles of sea room, and consist of six large islands—St. Mary's (1,528 acres), Tresco (697 acres), St. Martin's (515 acres), St. Agnes (313 acres), Bryher (269 acres), and Samson (78 acres)—and some 30 small ones, besides innumerable rocks and ledges, of which about 100 are named. They are composed entirely of a coarse type of granite, a continuation of that running through Devon and Cornwall. The name Scilly belongs strictly to a small, very inaccessible, double, rocky island in the N. W. of the group.

Athelstan conquered the islands in 938, and established monks on Tresco, the ruins of whose abbey still remain. Olaf Trygvason (995–1000), who forced Christianity on Norway and introduced it into Iceland, is said to have been converted by a hermit on one of the islands. They were handed over to the wealthy abbey of Tavistock by Henry I., but reverted to the crown upon the dissolution of the monasteries in 1539. In 1568 Queen Elizabeth leased them to Sir Francis Godolphin, who built the Star Castle on St. Mary's—over the doorway stands "E. R., 1593." They remained in his family for more than 250 years—hence the hamlet of "Dolphin" town on Tresco. They sheltered Prince Charles in 1645 before he fled to Jersey, and Cromwell's Tower on Tresco was set up by the Parliamentary forces. In 1831 they were leased to Augustus John Smith, a radical reformer though somewhat of an autocrat, and the best friend the islands have ever had. He made Tresco his home for 38 years, and his tropical gardens there are unique in northern Europe. He built churches and schools, suppressed smuggling, encouraged agriculture.

The climate is mild, but necessarily damp, and the weather is changeable and frequently stormy; but the temperature is extremely equable, averaging 58° F. in summer and 45° F. in winter. The leading natural features of the scenery are the fantastically weathered rocks and rock basins and the bold coast-lines. There are remains of cromlechs and stone circles; and a perfect kistvaen (containing human bones showing traces of fire action) was opened on Samson in 1862. Tresco Abbey and its gardens are considered the leading objects of interest for the tourist. There has been a lighthouse on St. Agnes since 1680, on Bishop Rock since 1858, and on Rock Island since 1887; there are also lights on the Wolf, the Seven Stones (floating), and the Longships off Land's End. Hugh Town on St. Mary's, the only town on the islands, with plain, substantial and uninteresting houses (mostly two-storied), has a church, two chapels, two hotels, banks, shops, schools, telegraph, and Jubilee Hall.

Wrecks used to be very numerous and were a fruitful source of wealth. One of the most famous was that of three ships of Sir Cloudesley Shovel's fleet in 1707, when 2,000 men, including the admiral, were drowned. The Scillonians also lived by pilotage, but steam and more lighthouses now help vessels to avoid the islands. Smuggling was formerly largely indulged in. In the early years of the 19th century, before the days of iron ships, there were three shipbuilding-yards on St. Mary's. Kelp making, introduced in 1684, has been given up. Farming is practiced, and early potatoes and broccoli are exported; but the principal industry now is the cultivation of narcissus and other lilies—100 tons of flowers being shipped in a single spring. Politically the islands belong to the St. Ives division of Cornwall. Pop. about 21,000.

SCINTILLATION, a twinkling of the stars; a familiar phenomenon to all who have directed their attention to the firmament above us. Under ordinary atmospheric conditions this flickering is possessed only by the so-called fixed stars. A planet shines steadily and by this mark can readily be picked out. When near the horizon, however, planets have been observed to scintillate slightly; while stars at low altitudes invariably twinkle more vigorously than stars overhead. This at once points to the atmosphere as an important factor, since the phenomenon is more pronounced when the light has to traverse a greater depth of air. Again, when viewed through sufficiently large telescopes stars cease twinkling altogether. The action of the telescope is to concentrate on the eye a much larger pencil of rays than could naturally enter it. Instead of one slender ray the eye receives the integral effect of a great number of rays, whose individual features are lost in the general average. In the case of a planet, again, the rays which fall on the retina converge from all parts of a disk of sensible size; and in the integral effect of this pencil the individual

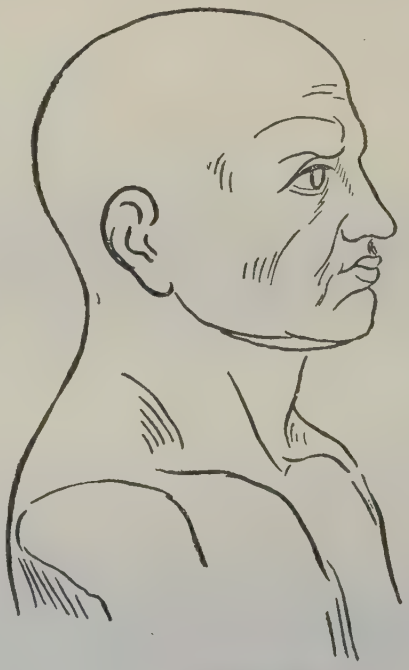
features of the component rays are lost. But a star is so far distant as to be virtually a point of light. In this case we have an excessively slender ray infinitely narrow compared even to the small pencil of light that comes to us from a planet. The vicissitudes of refraction which a star ray experiences in passing through the infinitely irregular variations of density, temperature, and humidity in our atmosphere characterize its integral effect on our retina, and the result is twinkling. It is possible indeed by separating the images of a star produced in the two eyes to observe two different scintillations at one and the same time. Scintillation may thus be said to depend on three factors: (1) The vast distance even of the nearest stars reducing the largest of them to mere points of light. (2) The ever-changing variableness in condition of the atmosphere through which the light must come to us. (3) The smallness of aperture of our eye, which receives an almost ideal single ray of light.

SCIO. See CHIOS.

SCION, a bud, or buds on a branch. A stick of buds ready for grafting is called a scion.

SCIOTO, a river of Ohio; general course, S.; length about 280 miles; flows into the Ohio river by a mouth 150 yards wide at Portsmouth. It is navigable for boats for about 136 miles. Its valley is one of the richest and best cultivated portions of the State.

SCIPIO, ÆMILIANUS AFRICANUS (THE YOUNGER), PUBLIUS CORNELIUS, conqueror of Carthage; born about B. C. 185. He was the youngest son of Æmilius Paulus, and the adopted son of Publius Scipio, son of Africanus the elder. In his youth he had the advantage of the instructions and friendship of Polybius, who, exiled from Greece, was permitted to live in the house of Æmilius Paulus. He was an industrious student of literature. He began his military service in Spain in 151; gained great reputation soon after in Africa, in the third Punic War; and in 147, though not of fit age, was chosen consul. The next year, accompanied by Polybius and C. Lælius, he went to Africa, and at once commenced the siege of Carthage, which was heroically defended. It was entered by the Romans in the spring of 146; desperate fighting took place from street to street, and a disastrous fire raged for days. Scipio, saddened by the horrors, foreboded a like fate for Rome. By order of the Senate the wall and houses were totally destroyed, and a curse pronounced against whoever should rebuild the city. Scipio had a magnificent triumph on his return. He led a simple and frugal life, and during his censorship, 142–141, tried to effect reforms in the manner of his countrymen, but without success. In 134 he was again consul, with Spain for his province; and his great achievement there

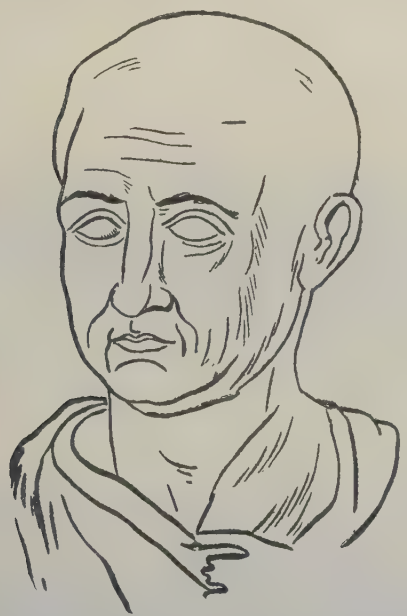


SCIPIO, THE YOUNGER

was the siege and capture of Numantia, for which he had the surname Numantinus. His marriage with Sempronia, sister of the Gracchi, was not a happy one. By his bold resistance to the proposed reforms he lost the favor of the popular party; and at last, in 129, he was found dead in his bed. Suspicion of murder fell chiefly on Carbo, a rash advocate of Agrarian reforms.

SCIPIO, AFRICANUS (THE ELDER), PUBLIUS CORNELIUS, one of the greatest of the Romans, born B. C. 234. He is said to have saved his father's life at the battle of the Ticinus, and prevented the desertion of the young nobles after the defeat at Cannæ. At the age of 24 he was chosen to command, as pro-consul, in Spain, where he laid siege to the city of Carthago Nova and took it the same year. His humane conduct on becoming master of the city excited general enthusiasm. He was even offered the sovereignty of Spain, but declined to be more than general of the Roman people. Dur-

ing the next three years Scipio made himself master of all Spain except the town of Gades. In order to prepare the way for the invasion of the Carthaginian territory he made a secret visit to the court of Syphax, King of Numidia, and won his alliance. In 206 he returned to Rome and was chosen consul for the next year. Sicily was given to him as his province, and leading an army of volunteers, he crossed, in 204, into Africa, and began the siege of Utica, but on the approach of Hasdrubal retired into winter quarters. In the spring he burnt the camp of the enemy, and destroyed the fugitive



SCIPIO, THE ELDER

forces. Syphax, who had joined Hasdrubal, was captured, and Cirta surrendered to the conquerors. Hannibal was called to oppose Scipio in Africa, and the second Punic War was terminated by the total defeat of Hannibal at the battle of Zama, Oct. 19, 202. Peace was signed the next year, and Scipio, on his return home, had the most splendid triumph, and received the surname Africanus. He declined other honors which were offered him; was subsequently censor, consul a second time, and in 193 ambassador to Antiochus, King of Syria, at whose court he is said to have met Hannibal. Having accompanied his brother Lucius to the Syrian War as lieutenant in 190, they were accused of misappropriation of moneys received from Antiochus. Cato was the leader of the party opposed to Scipio, and the prosecution of Lucius was successful, but that of Africanus was dropped by the advice of Tiberius Gracchus. The popularity of Scipio had waned, and he left Rome never to return. He died at his villa, in Liternum, 183 B. C., the same year in which Hannibal died.

SCIRPUS, a genus of plants of the order *Cyperaceæ*. The plants of this genus are called club rushes, and the common bulrush (*S. lacustris*) of ponds and sluggish streams is a familiar example. The rhizomes of *S. dubius* are eaten by the natives of the S. of India; as are the tubers of *S. tuberosus* by the Chinese, who cultivate the plant in tanks and ponds. The species of this genus, about 300, are universally diffused, though found chiefly in temperate climates. They date from the Lower Miocene period.

SCOLLARD, CLINTON, an American poet; born in Clinton, N. Y., Sept. 18, 1860. In 1888 he was made assistant Professor of Rhetoric at Hamilton College, and later Professor of English Literature, resigning in 1896 to devote himself to literature. Among his publications are: "Pictures in Song" (1884); "With Reed and Lyre" (1886); "Old and New World Lyrics" (1888); "Giovio and Giulia" (1891); "Songs of Sunrise Lands" (1892); an edition of Ford's "Broken Heart" (1895); "A Christmas Garland" (1897); "A Man at Arms" (1898); "Lawton" (1900); "Poems—Selected" (1914); "Let the Flag Wave" (1917), etc.

SCONE, a parish in Perthshire, Scotland, lying on the left bank of the Tay. It is famous as the seat of one of the most venerable of Scotch abbeys. Scone is first mentioned in the beginning of the 10th century, when a council was held there in the sixth year of the reign of King Constantine, when it was styled the "royal city." A monastery was built at Scone probably about the same period, and there was located the famous stone on which the kings of Scotland were inaugurated, and which was carried by Edward I. of England to Westminster Abbey. Alexander III., the last of the ancient race of kings, and Robert Bruce, the founder of the new dynasty, were crowned at Scone. The last coronation which was celebrated here was that of Charles II., in 1651.

SCOPAS, an ancient Greek sculptor, founder, along with Praxiteles, of the later Attic school; a native of the island of Paros, and flourished during the first

half of the 4th century B. C. One of his earliest works was the temple of Athena Alea at Tegea in Arcadia, on the site of a previous one burned down in 395 B. C. Some 15 years or so later he settled in Athens, where for more than a quarter of a century he labored at his profession. Toward the end of his life he was associated with Leochares and others in preparing sculpture for the great mausoleum of Halicarnassus in Asia Minor. A large composition, representing Achilles being convoyed to Leucæ by Poseidon, Thetis, and the Nereids, preserved for some time in the temple of Neptune at Rome, was accounted one of his masterpieces. He excelled also in statues of single gods and goddesses.

SCORBUTUS. See SCURVY.

SCORE, in music, compositions for several voices or instruments, or for an orchestra, so written that each part has a separate staff for itself, these staves being placed over each other, bar corresponding for bar.

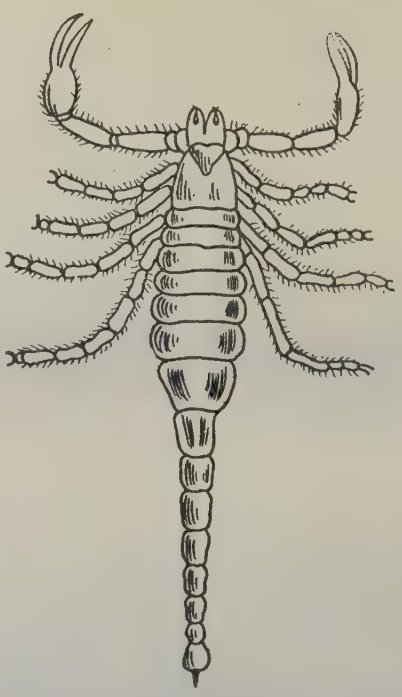
SCORIÆ, the cinders and slags of volcanoes, more or less porous from the expansion of the gases contained in the melted materials.

SCORPIO, in astronomy, the eighth zodiacal constellation. It is bounded on the N. by Ophiuchus and Serpens, on the S. by Lupus, Norma, and Ara, on the E. by Sagittarius, and on the W. by Libra. It is a small but very brilliant constellation, especially when seen from places S. of the equator. It contains Antares or Cor Scorpii (Alpha Scorpii), of the first magnitude, and Iklil, or Beta Scorpii, of the second magnitude. Also the eighth sign of the zodiac, which the sun enters about Oct. 23.

SCORPION, in antiquity, a military engine, formerly used chiefly in the defense of a castle or town. It resembled the balista.

In Scripture, a painful scourge; a kind of whip armed with points like a scorpion's tail.

In zoology, any individual of the family *Scorpionides*. The European species are three or four inches long, and confined to the S. parts of the Continent, but scorpions have a wide geographical range in tropical and sub-tropical regions, and in Equatorial Africa and South America they grow to a length of 9 or 10 inches. The sting in the tropical species is much more formidable than that of the European scorpion. They are nocturnal in habit. They prey on spiders and other insects; and, seizing their prey in their palpi, which are practically useless as weapons of offense, sting it to death. The eggs are hatched in the enlarged oviducts,



CAROLINA SCORPION

and the young, usually from 40 to 60, are carried about for some time on the back of the mother.

SCOT, REGINALD, or REYNOLD, one of the first and boldest writers against the belief in witchcraft, alchemy, astrology, and other prevalent superstitions of his time, born in Kent early in the 16th century. He studied at Oxford, and spent his life in the study of old and obscure mystical authors, and in gardening. His reputation is founded on "The Discoverie of Witchcraft," published in 1584. By order of James I. the first edition of the book was burned by the common hangman, and the king replied to it in his "Demonology." He died in 1599.

SCOTCH FIR, the *Pinus sylvestris*, a tree sometimes 50 to 100 feet in height, and 12 feet in girth, the wood constituting the red or yellow deal, and its resin, yielding tar, pitch, and turpentine. It constitutes vast natural forests in the Highlands of Scotland, occurring also in the N. of Europe, and on the mountains in its S. part, in Siberia, etc. The bark is used for tanning.

ORKNEY AND SHETLAND ISLANDS
SCALE OF MILES
0 20 40 60
SHETLAND
St. Magnus B.
PAPA STOUR
FOULA
Scalloway
Lerwick
BRESSAY I.
Sumburgh Hd.
WHALSEY
PAPA WESTRAY
WESTRAY
ROUSAY
EDAY I.
N.RONALDSAY
MAINLAND
ORKNEY
S.RONALDSAY
Pentland Firth
CAITHNESS
Kirkwall
Cape Wrath
Dunnet Hd.
John O'Groats Ho.
Duncansbay Hd.
Noss Hd.
Sinclairs Bay
Wick
Pulteneytown
CAITHNESS
Ben Hope
Ben Loyal
Ben Klibreck
Ben More
Ben Armine
Morven
SUTHERLAND
Berriedale
Helmsdale
Port Gower
Brora
Dunrobin Castle
Golspie
Dornoch
Dornoch Firth
Tarbat Ness
Portmahomack
Tain
Edderton
Ben Wyvis
ROSS
CROMARTY
Dingwall
Fortrose
Cromarty
Inverness
NAIRN
Nairn
Forres
ELGIN
Elgin
Lossiemouth
Burghead
Findhorn
Garmouth
Port Gordon
Portknockie
Cullen
Portsoy
Banff
Macduff
Troup Hd.
Gardenstown
Rosehearty
Fraserburgh
Kinnaird Hd.
Rattray Hd.
Peterhead
Boddam
Old Deer
Mintlaw
Ellon
Newburgh
R. Ythan
ABERDEEN
Aberdeen
Girdle Ness
Old Aberdeen
Dyce
Kintore
Inverurie
Oldmeldrum
Inch
Fyvie
Huntly
Keithall
New Deer
Turriff

SCOTLAND
ATLANTIC OCEAN
NORTH CHANNEL
SOLWAY FIRTH
FIRTH OF FORTH
EDINBURGH AND VICINITY
SCALE OF STATUTE MILES
0 5 10 15 20 25 30 35 40 45
SCALE OF KILOMETERS
0 10 20 30 40 50 60
Important towns are shown in heavy face type
Important Railways
Canals
County Seats are underlined thus: Perth
C Longitude 5° West D from 4° Greenwich E 3° F 2° G
Edinburgh
Glasgow
Dundee
Aberdeen
Perth
Stirling
Inverness
Ayr
Dumfries
Kilmarnock
Greenock
Paisley
Leith
Portobello
Musselburgh
Dunfermline
Kirkcaldy
Arbroath
Montrose
Berwick
Peebles
Selkirk
Jedburgh
Hawick
Kelso
Melrose
Galashiels
Haddington
North Berwick
Bass Rock
Inchcape
Bell Rock L.H.
Fife Ness
St. Andrews
St. Andrews Bay
Ferryden
Lunan B.
Red Hd.
Buddon Ness
Broughty Ferry
Tayport
Newport
Cupar
Falkland
Kinross
Loch Leven
Loch Tay
Loch Rannoch
Loch Lomond
Loch Awe
Loch Etive
Loch Linnhe
Loch Sunart
Loch Shiel
Loch Ness
Loch Lochy
Loch Arkaig
Loch Eil
Loch Shiel
Ben Nevis
Ben More
Ben Lawers
Ben Cruachan
Ben Lomond
Ben Vorlich
Schiehallion
Ben Lui
Ben Ledi
Ben Venue
Ben Chonzie
Ben Voirlich
Ben Alder
Ben Hope
Ben Loyal
Ben Klibreck
Ben Wyvis
Ben Nevis
Ben Cruachan

SCOTER, or SURF DUCK (*Oidemia*), a genus of sea ducks. The most familiar species is the common or black scoter (*O. nigra*), which shows a deep black plumage in the male, the bill and legs being of the same color. The upper mandible is marked on its dorsal surface by a line of orange color. The females are colored of a dark brown hue. It occurs in the Arctic regions in summer. An American species of coot is known as surf duck.

SCOTIA, the Latin name of Scotland, often used by her poets. The word is said to be derived from Queen Scota, the wife of a King of Ireland, who is thought to have invaded Scotland in 258 A. D. Previous to this event the land was known as CALEDONIA (*q. v.*).

SCOTLAND, the northern division of the island of Great Britain; separated from England substantially by the Solway, Cheviots, and Tweed, the border isthmus being about 60 miles across; but the irregular boundary line measures fully 100 miles. On all other sides it is bounded by the sea. Area, 29,797 square miles. The greatest length, from N. N. E. to S. S. W., between Dunnet Head and the Mull of Galloway, is 287 miles. The breadth varies from 140 miles to less than 26, the latter in the N., between Dornoch Firth and Loch Broom. Few points in the mainland are more than 40 miles from the sea, the country being so much penetrated by inlets. The country was formerly divided into a number of districts, many of the names of which are still familiar, such as Lothian, Tweeddale, Galloway, Breadalbane, etc., but for political purposes it is now divided into 33 shires or counties. The population in 1911 was 4,760,904; the estimated population in 1919 was 4,894,100.

The most important cities, with their estimated population in 1918, are: Glasgow, 1,111,428; Edinburgh, 333,883; Dundee, 181,777; and Aberdeen, 166,564.

Islands and Coasts.—The islands of Scotland are said to number altogether nearly 800. On the E. coast they are few and small; but on the N. E. are the two large groups of the Orkneys and Shetlands, the former numbering 90 islands, 28 permanently inhabited; the latter 100 islands, 29 inhabited; while on the W. coast the islands are large and numerous. Here the Hebrides extend for 200 miles from N. to S., and are divided into the Inner and Outer Hebrides, the former lying close to the W. coast of the mainland and stretching from Skye to Islay; the latter parted from the Inner Hebrides by the straits of the Minch and the Little Minch, comprise the long chain of islands from Lewis to Benbecula. Inclosed in the Firth of Clyde are the islands of Arran, Bute, and the Cumbraes, forming a county by themselves. The W. coast of the mainland is generally a wild, deeply indented mountain wall, presenting a series of inlets or sea lochs, while toward the middle the coast is cleft by two great inlets with openings to the S. W., the Firth of Lorn and its continuation Loch Linnhe, and the Firth of Clyde and its ramifications running far inland. The E. coast is sometimes low and sandy, but is often formed of steep rocky cliffs of considerable elevation, the chief inlets being the Firths of Forth and Tay, and the Moray Firth, Cromarty Firth, etc.

Surface.—Both from the configuration of the surface and the geological structure the country divides into three divisions, the Highlands, Central Lowlands, and Southern Uplands. The first of these divisions lies N. of a line stretching in a S. W. direction from the coast of Kincardineshire to the Firth of Clyde; the third is the country S. of a line drawn from Dunbar S. W. to Girvan; the country between these lines forms the Central Lowlands. The Highland division is remarkable for the number and elevation of its mountain masses, many of the summits being over 4,000 feet high. The mountains best known by name are the Grampians, which form a system or series of masses covering a large area, and culminating on the W. coast in Ben Nevis, 4,406 feet high; while 55 miles to the N. E. rises a remarkable cluster of summits reaching in Ben Macdhui the height of 4,296 feet. The Grampians and their connections are separated from the mountains farther to the N. by Glenmore or the Great Glen of Scotland, a remarkable depression stretching quite across the country from sea to sea, and forming, by the series of lakes occupying it and the Caledonian canal connecting them, a waterway from the W. coast to the E. The Southern Uplands are also essentially a mountainous region, summits of over 2,000 feet being frequent, though none exceed 3,000 feet above the sea. The central region, though much less elevated than the other two divisions, has none of the monotony usual in flat countries. Though occupying not more than a sixth of the whole surface, the fertility of the soil and its mineral treasures make this part by far the wealthiest and most populous. The present form of the land surfaces of Scotland is the effect of erosion or denudation. The country was at one time an elevated table-land, the upper surface of which is indicated by the summits of the mountain masses, but has been deeply trenched and furrowed in all directions by the erosive action of water, ice, and frost. The slope of the ancient plateau may be determined by the direc-

tion of the principal rivers; in the N. part it is chiefly toward the E., in the S. more equally E. and W.

Rivers and Lakes.—The chief rivers flow (roughly speaking) to the E., and enter the German ocean, the largest being the Tweed, Forth, Tay, South Esk, North Esk, Dee, Don, Deveron, Spey, and Findhorn; those entering the sea on the W. are the Clyde, Ayr, Doon, Dee, Nith, Annan, and Esk. The Tay carries to the sea a larger quantity of water than any river in Great Britain, but neither it nor most of the others, except when they form estuaries, are of much use for navigation. The Clyde, however, in its lower course carries a vast traffic, this being rendered possible chiefly by dredging. Many of the rivers are valuable from the numbers of salmon they produce. A striking feature of the country is the great multitude of lakes, varying in size from Loch Lomond (28 square miles) to the pool-like mountain tarns. In the Northern Highlands almost every glen has its lake and every mountain hollow is filled by a stream or spring. Among the more noted are Lochs Lomond, Katrine, Tay, Earn, Rannoch, Awe, Shiel, Laggan, Lochy, Ness, Maree, Shin, in the Western and Northern Highlands; and St. Mary's Loch, Lochs Ken, Dee, and Doon in the Southern Uplands.

Geology.—As regards geology the older or palæozoic rocks predominate almost everywhere in Scotland. The Highlands are composed almost entirely of crystalline schists, gneiss, and quartzites; the Central Lowlands of odd red standstone, carboniferous, and Permian strata; the Southern Uplands mostly of rocks of Silurian age. In certain localities remains of secondary formations are represented over small spaces, while volcanic rocks cover considerable areas. Granite exists in great masses in many localities, and in some parts is extensively quarried. The most valuable mineral region is the Central Lowlands, where coal and iron exist in such quantity as to make this one of the most important mineral fields of Great Britain.

For agriculture, manufactures and commerce, see GREAT BRITAIN.

Political Constitution.—The Parliament of Scotland anciently comprised all who held any portion of land, however small, from the crown by tenure of military service, till the reign of James VI., when the small barons or freeholders were excused from attendance in person, "two or more wise men" being deputed from each county in proportion to its size. Its powers were nominally extensive, but the supreme power was virtually in the king, who by his influence often entirely controlled its proceedings. The Parliament in the whole consisted of three estates—the nobility, the dignified clergy (consisting of bishops, abbots, and priors), and the lesser barons, or representatives of shires and burgs. When PRESBYTERIANISM (*q. v.*) was formally ratified by law after the revolution of 1688, the ecclesiastical estate ceased to have a place in Parliament. Every measure brought before Parliament was previously prepared by a committee, styled the lords of the articles, chosen from each of the three orders, but in effect little better than royal nominees. Before the Union there were four great officers of state—the lord high-chancellor, the high-treasurer, the lord privy-seal, and the secretary; and there were also four lesser officers—the lord clerk-register, the lord-advocate, the treasurer-depute, and the justice clerk. Previously to the era of the Revolution the privy council of Scotland assumed inquisitorial powers, and even torture was administered under the sanction of its authority; but it is now entirely merged in the privy council of Great Britain. The number of peers in the Scotch Parliament was formerly 160, and of commons 155, and all sat in one house and voted promiscuously. At the union of the kingdoms the political system of Scotland was almost entirely incorporated with that of England. (See GREAT BRITAIN, *Government.*)

The Court of Sessions is the supreme civil court of Scotland. The Court of Justiciary, or criminal court, composed only of judges of the Court of Session, is supreme in the highest sense, since its decisions in criminal cases are not subject to any review. The principal subordinate judicatories are sheriff courts, established in each county or stewartry. Sheriff-substitutes, or judges ordinary, one or more holding separate courts in different districts, decide in the first instance, subject to the review of the principal sheriff or sheriff depute, whose decisions, though final within the limits of his jurisdiction, are reviewable by the Court of Session, with the exception of classes of cases provided for by special statutes. Besides the sheriff court, each county or district of a county has its justice of peace courts, in which judges, not stipendiary, decide on principles of equity in minor crimes; and in every town of any importance are bailie, dean of guild, and police courts, with limited jurisdictions.

Education.—Scotland has had the advantage of a national system of elementary education for over two centuries, a school having been established in every parish by a law of 1697, according to a system proposed by John Knox long before. This scheme did effective service

for the education of the people, till the great increase of population, especially in towns, rendered it unequal to the task laid on it, and this notwithstanding the erection of many schools by various religious denominations. By the passing of the Education Act of 1872 board schools have superseded the old parish schools, there being also numerous grammar or high schools and academies in every town of any size, though no systematic scheme of secondary education. Other institutions are the normal or training schools and colleges of the different religious bodies, and the four universities of Edinburgh, Glasgow, Aberdeen, and St. Andrews. The first university was that of St. Andrews, dating from 1451; next came that of Glasgow (1450), then King's College and University Aberdeen (1494), then Edinburgh University (1582), lastly Marischal College and University Aberdeen (1593). The two Aberdeen universities were united in 1860.

History.—Scotland was first visited by the Roman troops under Agricola, who penetrated to the foot of the Grampian mountains. It was afterward exposed to the ravages of the Norwegians and Danes, with whom many bloody battles were fought. Various contests were also maintained with the Kings of England. Robert Bruce, however, secured the independence of the country and his title to the throne by the decisive battle of Bannockburn in 1314. He was succeeded by his nephew, Robert Stewart, and he by his eldest son, Robert. He being a weak prince, the reins of government were seized by the Duke of Albany, who stoned to death the eldest son of the king. James, his second son, to escape a similar fate, fled to France; in the year 1424 he returned to Scotland, and having excited the jealousy of the nobility, he was assassinated in a monastery near Perth. James II., his son, an infant prince, succeeded him in 1437. He was killed by the bursting of a cannon at the siege of the castle of Roxburgh. James III. ascended the throne at the age of seven years. His reign was weak and inglorious, and he was murdered in the house of a miller, whither he had fled for protection. James IV., a generous and brave prince, began his reign in 1488. He was slain at the battle of Flodden. James V., an infant of less than two years of age, succeeded to the crown. He died in 1542, and was succeeded by his daughter, the celebrated Queen Mary, whose history and tragical end are well known. She was succeeded by her son James, who, in 1603, ascended the throne of England, vacant by the death of Queen Elizabeth, when the two kingdoms were united into one great monarchy which was legislatively united in 1707. In 1715 and 1745, unsuccessful attempts were made for the restoration of the exiled Stuarts.

SCOTLAND, CHURCH OF, the original Scotch Church seems to have been that of the Culdees, then in mediæval times the Roman Catholic Church was, to a certain extent, the national church in Scotland, not merely as having within its pale at least by profession all the people, but as maintaining its independence of its powerful S. neighbor. The church resisted the claims of supremacy over it put forth at one time by the Archbishop of York, at another by the Archbishop of Canterbury; and in 1176 in self-defense cast itself into the arms of the Roman pontiff. When the Reformation struggle began, the crown remained adherent to the old faith, while the nobility tended to adopt the new. From the war of independence Scotland had considered it good policy to guard against any aggression on the part of England by a close alliance with France, and when the Reformation began there were actually French troops in Scotland. On these the crown rested to resist the religious movement which had been begun, but the Protestant "Lords of the Congregation," who had taken up arms to defend their cause, applied for aid to Queen Elizabeth, who sent troops to aid them in expelling the French. By a treaty signed on July 7, 1560, it was stipulated that both the French and the English troops should withdraw from Scotland. On Aug. 24 of the same year the Scotch Parliament abolished the papal jurisdiction, prohibited the celebration of the mass, and rescinded all the laws made in favor of Roman Catholicism. The reformers adopted what is now called PRESBYTERIAN CHURCH (*q. v.*) government, though certain superintendents were appointed, with the sanction of John Knox, the great Scotch reformer, whose offices after a time were swept away. The first General Assembly was held on Dec. 20, 1560. When the victory over the Church of Rome was complete, the alliance between the nobility and the Protestant preachers which had effected the triumph showed symptoms of dissolving, and a large section of the former viewed with distrust, and even active hostility, what they regarded as the too democratic measures which Knox aimed at carrying out. But one inestimable boon was gained before they parted, the universal establishment of parish schools.

The semi-republican constitution of the Church, which became more marked after the office of superintendent had been swept away, and the second book of dis-

cipline published (the latter event in 1578), created jealousy in the minds of regents and of sovereigns, and four or five generations of Stuart kings put forth long and determined efforts to transform Presbyterian into Episcopal government. The project cost the lives and liberties of far more people than the short, sharp Reformation struggle had done, and ended at last in failure. The Revolution settlement of 1690, re-established Presbyterianism, and the General Assembly, which had been interrupted for nearly 40 years, began again to sit and has done so annually from that time till now. Prior to the union with England in 1707, an Act of Security was passed, designed to preserve the Scotch national Church from being overthrown by S. votes.

In 1712 an Act of Parliament reintroduced patronage which had been swept away. The operation of this enactment was one main cause of these secessions; that of the Secession, pre-eminently so-called, in 1733; the Relief in 1752; and, the greatest of all, that which created the Free Church in 1843.

The Church of Scotland leads the Presbyterian denomination with a membership of over 700,000. It has missions in India, Africa, and elsewhere. In 1784 the Patronage Act of 1712 was repealed, and each congregation now elects its own pastor. Its chief rivals, the United Presbyterian and the Free Church of Scotland, were amalgamated as the United Free Church of Scotland. A small number of the old Free Church members declined to join the union and remain an independent body. The United Free Church membership (1919) was 522,028.

SCOTS. See PICTS.

SCOTT, EMMETT JAY, an American negro educator, born at Houston, Tex., in 1873. He was educated at Wiley University, Marshall, Tex. After engaging in newspaper work for several years, he became the secretary of Booker T. Washington, and from 1912 to 1919 was secretary of the Tuskegee institute. From 1919 he was secretary and treasurer of Howard University. During the World War he served as special treasurer of secretary of War to advise on matters affecting negro soldiers. He wrote "Booker T. Washington, Builder of a Civilization" (1916); "The American Negro in the World War" (1919). He also contributed many articles to newspapers and magazines on the negro question.

SCOTT, HUGH LENOX, an American military officer; born in Danville, Ky., Sept. 22, 1853; was graduated at the United States Military Academy in 1876, and detailed to duty in the West, where he served in numerous Indian campaigns till 1897, receiving honorable mention from the War Department for his gallantry in the "Ghost-dance" outbreak in 1891. At the beginning of the Spanish-American War he was placed in command of the 1st Army Corps; was appointed adjutant-general of the Department of Havana in 1898, and of the Department of Cuba in 1900.

His other assignments included: Acting-Governor of Cuba, 1900–1902; Governor of the Philippines, 1903–1906; Superintendent United States Military Academy, 1906–1910; Lieutenant-Colonel and Colonel of Cavalry, 1911; Commander United States troops on southern border of Texas to California, 1913–1914; assistant Chief-of-Staff, 1914; settler of trouble on Mexican border at Naco, Ariz., June, 1915; appointed Major-General, 1915; service in Mexico, 1917; Commander 78th Division of National Army, Camp Dix, 1917. Was active at Arras, Chalons, Passchendael Ridge, 1917; awarded honorary degrees by Princeton and Columbia. Besides a monograph "Sign Language of the Plains Indians," he published numerous papers.

SCOTT, HUGH STOWELL, an English novelist, writing under the pen-name of Henry Seton Merriman. He was born at Newcastle-upon-Tyne in 1862. His stories of adventure were widely read. They include "Phantom Future" (1889); "Slave of the Lamp" (1892); "With Edged Tools" (1894); "Velvet Glove" (1901); "The Vultures" (1902). He died in 1903.

SCOTT, JAMES BROWN, an American educator and lawyer, born in Kincardine, Ontario, in 1866. He graduated from Harvard in 1890. Winning the Parker fellowship of that university, he traveled in Europe and studied at the universities of Berlin, Heidelberg, and Paris. From 1894 to 1899 he practiced law in Los Angeles. He founded and for three years was dean of the law school of the University of Southern California. From 1899 to 1903 he was dean of the college of law at the University of Illinois, and for the three years following was professor of law at Columbia. From 1905 to 1906 he was professor of law at George Washington University, and from the latter year was professor of international law. From 1906 to 1911 he served as solicitor of the State Department and was counsel for the United States on many important litigations, including the North Atlantic Fisheries Arbitration before The Hague. In 1909 he became lecturer on international law at Johns Hopkins University. He was appointed secretary of the Carnegie Endowment for

International Peace, was president of the American Institute of International Law, and was a delegate to many scientific and political conferences. During the Spanish-American War he served in the 7th California Infantry. He edited many volumes dealing with international law, and was the author of "The Hague Peace Conferences of 1899 and 1907" (1909); "An International Court of Justice" (1916); "Survey of International Relations Between the United States and Germany" (1918).

SCOTT, LEROY, an American writer, born at Fairmount, Ind., in 1875. He graduated from the University of Indiana in 1897 and until 1900 engaged in newspaper work. In 1902–3 he was assistant headworker of the University settlement of New York. From 1904 he devoted himself entirely to writing. His books include "The Walking Delegate" (1905); "The Shears of Destiny" (1910); "No. 13 Washington Square" (1914); "Mary Regan'" (1918); and "A Daughter of Two Worlds" (1919).

SCOTT, or SCOT, MICHAEL, a Scotch philosopher of the 13th century. Of his life little is known. His nationality even is in doubt: the Italians and the Spaniards as well as the Scotch claimed him as their countryman. His great learning won for him the reputation of being a magician. His writings treat of astrology, alchemy, and the occult sciences in general; among them are treatises "On the Sun and Moon," "On Palmistry," "On Physiognomy and Human Procreation." According to traditions he died in 1230 and was buried in Melrose Abbey.

SCOTT, ROBERT FALCON, an English Antarctic explorer and naval officer, born in Devonport, in 1868. He joined the navy, where he became torpedo lieutenant. In 1901 he was given command of the Royal Geographical Antarctic exploration, in which, with a base on McMurdo sound, he made expeditions which resulted in important discoveries, including King Edward VII Land and Victoria Land. On his return he was promoted to be captain and received degrees from Cambridge and Manchester universities. He was also awarded gold medals by several geographical societies. In 1910 he was appointed commander of the British National expedition, which also operated from McMurdo sound. Its chief object was to reach the South Pole, and this was accomplished after a continuous sledge journey of 1,842 miles. The pole was reached on January 18, 1912. It had, however, already been reached by Amundsen, five weeks before. On the return journey, the entire party perished. Scott himself died from starvation and exposure on Mar. 29, 1912, within 155 miles of the home station. In 1915 a bronze statue

CAPTAIN ROBERT FALCON SCOTT

of Captain Scott was unveiled in Waterloo Place, London. He wrote "Voyage of the Discovery" (1905). "Scott's Last Expedition" was published after his death, in 1913.

SCOTT, THOMAS ALEXANDER, an American railroad manager; born in Loudon, Pa., Dec. 28, 1824; became connected with the Pennsylvania railroad in 1850; was made its general superintendent in 1858, and its vice-president in the following year. When the Civil War broke out he was placed on the staff of Gov. Andrew G. Curtin of Pennsylvania, and had charge of the sending of volunteers to the front. In April, 1861, the Secretary of War requested him to build a railroad branch from Philadelphia to Washington, which he did in a surprisingly short time; in May, 1861, he was commissioned a colonel of volunteers and placed in command of all government telegraphs and railroads. On Aug. 1 of the same year he was appointed assistant Secretary of War. He resigned this post in June, 1862, to give his time wholly to railroad management; but re-entered the service of the government in September, 1863, and directed the movement of two army corps to Chattanooga to relieve Gen. William S. Rosecrans. He was president of the Pennsylvania Railroad Company in 1874–1880. In the latter year he was forced to resign by ill health. He died in Darby, Pa., May 21, 1881.

SCOTT, SIR WALTER, a British author. He was born in Edinburgh on August 15, 1771, the son of Walter Scott, writer of the Signet, and Anne Rutherford, daughter of a professor in the University of Edinburgh. His family belonged to the border country between England and Scotland, and numbered among its members many adventurers and heroes such as figure in the writings of their illustrious descendant. Losing the use of his right leg while an infant, he was sent to his grandfather's farm, where he recovered his general health though he remained lame for life. Here he learned from his grandmother the songs and legends of the countryside, and began to store his memory with the folklore that served him so well when he began to write. He was educated at the Edinburgh High School and the University, but did not graduate. Before he was fifteen he became apprentice to his father, and in 1792 he was called to the bar. His practice grew slowly, and he used his leisure for society, in which he distinguished himself by his gift of storytelling, for excursions in which he got to know thoroughly many parts of Scotland and their local legends, and for wide reading in French, Italian, Spanish, and German as well as English. In 1797, he married Charlotte Mary, daughter of Jean Charpentier, a French refugee.

By this time he had begun to turn to literature and was translating German ballads. Publication began with versions of "Bürger's Lenore" and "The Wild Huntsman" (1796), which were followed in 1799 by a translation of Goethe's "Goetz von Berlichingen." Meantime he had developed a military enthusiasm and had organized a volunteer regiment and a body of cavalry; and through the friends made in this connection he was appointed sheriff-substitute of Selkirkshire. This increased his income, and at the same time gave him opportunity for touring his favorite district. In 1802 he began the publication of "The Minstrelsy of the Scottish Border," in which he gave the public the benefit of years of ballad-collecting, and in which he included some imitations by himself and his friends. This work led to the composition of his first long poem, "The Lay of the Last Minstrel" (1805), the success of which definitely decided him to adopt a literary career. He retained his office, however, and went to live at Ashestiel on the Tweed, near Selkirk. In 1805 he became a partner of his printer Ballantyne, and got interested in publishing speculations, among which was his own edition of Dryden's complete works. He also took an active interest in politics as a warm Tory partisan. "Marmion" was published in 1808 and repeated the success of the "Lay," and the next year he joined the staff of the new "Quarterly Review." "The Lady of the Lake" followed in 1810, and sold 20,000 copies. In 1812 he bought the estate and began building the mansion of Abbotsford on the Tweed, and continued his poetical work with "Rokeby" (1812) and "The Bridal of Triermain" (1813). These poems had less success than their predecessors. They were less animated, his style had lost its novelty, and Byron's romantic tales were beginning to rival Scott's. He published later "The Lord of the Isles" (1815) and "Harold the Dauntless" (1817), but their comparative lack of success was more than redeemed by a new triumph. In 1814 he took up and completed a manuscript novel, "Waverley," begun long before and laid aside. It was an immediate success, and for the next decade Scott poured forth with amazing fertility a series of novels of which the most important were "Guy Mannering" (1815), "The Antiquary" (1816), "Old Mortality" (1817), "Rob Roy" (1818), "The Bride of Lammermoor" (1819), "Ivanhoe" (1819), "The Monastery" (1820), "The Abbot" (1820), "Kenilworth" (1821), "The Fortunes of Nigel" (1822), "Quentin Durward" (1823), "St. Ronan's Well" (1824), "Red Gauntlet" (1824), "The Talisman" (1825). In 1827 the authorship, hitherto a secret, was acknowledged. In these romances Scott availed himself of the vast store of history and legend he had been accumulating from childhood, and of his extraordinary power of making vivid the personages, manners, and customs of past times. Most of the qualities of his poems find in his prose fiction a more favorable medium, and in the latter he displayed a power of drawing character of which the poems gave little sign. The novels were received at home with unexampled enthusiasm, and their vogue extended over the continent and evoked many imitations.

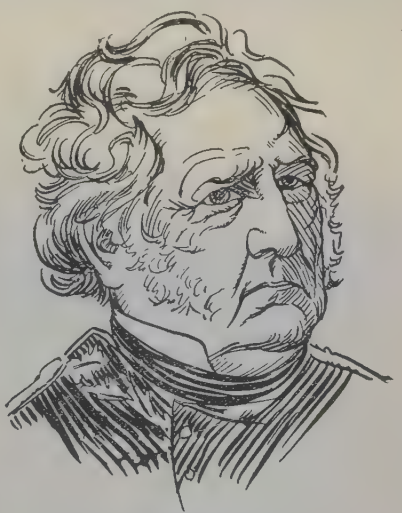
The enormous sale of the novels brought Scott large sums, some £76,000 of which he spent on Abbotsford, completed as a baronial castle in 1824. He entertained lavishly, bought land to enlarge his estate, and was generous in his gifts to relatives and fellow authors. In 1820 he was made a baronet. He became, however, deeply involved in the affairs of his printers and publishers, and when in 1826 these failed, Scott was ruined. While the publishers went into bankruptcy, Scott personally assumed the liabilities of £117,000 of Ballantyne & Co., and set to work to earn money to pay the creditors in full. Scarcely had he begun this colossal task when Lady Scott died. His life was clouded further by fears for the

life of his grandson, John Hugh Lockhart, who was suffering from a mortal disease. Nevertheless, he kept heroically at work, earned £8,228 with "Woodstock" (1826) in three months, and £18,000 with his "Life of Napoleon" in nine volumes. "Tales of a Grandfather" (1828-1830) followed, and with the "Chronicles of the Canongate" (1827) and an edition of his works with autobiographical prefaces enabled him to raise nearly £40,000 in two years. He went on with "The Fair Maid of Perth" (1828) and "Anne of Geierstein" (1829), but in 1830 was interrupted by a stroke of paralysis. When he resumed with "Count Robert of Paris" (1831) a decline in his powers was unmistakable. A second and third attack followed, but he toiled on, and even found time for political activity. After finishing "Castle Dangerous" (1831) he was taken to Naples in the hope of prolonging his life, and there heard of the death of his grandson. In the following spring, on his return journey, he was again struck down by paralysis, and was brought home half unconscious. They carried him to Abbotsford, where he died within sound of his beloved Tweed, on Sept. 21, 1832. He was succeeded in the baronetcy by his eldest son Walter, on whose death in 1847 the title became extinct. Scott's life insurance and his copyrights were sufficient to settle the unpaid balance of his obligations, so he may be regarded as having won his heroic fight to clear his name and estate from debt.

Scott's struggle to the death to pay what was due to his creditors is typical of the most fundamental trait in his character. From his ancestry or from the age of chivalry to which he gave so romantic a devotion he caught the spirit of honor which he carried into the mazes of modern business. For the rest he was a loyal friend, a generous enemy, a warm partisan without personal rancor, a devoted patriot. In spite of his romanticism, his character had a basis of solid common sense, and his broad sympathy and hearty humor made his contact with his fellows human and healthy. These qualities pervaded his work. His poetry is vivacious and picturesque, seldom passionate or lofty; his prose admirably suited to a born story teller with a keen observation of the variety if not the subtlety of human nature. In his fiction he professed no higher motives than the providing of wholesome entertainment, and the awakening of patriotism and an interest in the past. These purposes he achieved with brilliant success; for few writers have given more harmless pleasure, or have aroused in more readers a curiosity about former ages, or have created so large a company of imaginary characters. He succeeded best with figures that could be drawn in strong colors, least with normal young men and women. He was a great artist in the picturesque. Among men of letters it is hard to find a truer man.

SCOTT, WALTER DILL, an American educator, born at Cooksville, Ill., in 1869. He graduated from the Illinois State Normal University in 1891, from Northwestern University in 1895, and took post-graduate studies at the University of Leipzig. From 1901 to 1908 he was associate professor of psychology and education and direction of the psychological laboratory at Northwestern University, and from 1908 was professor of psychology at the same institution. In 1916-17 he was director of the Bureau of Salesmanship Research at the Carnegie Institute of Technology. During the World War he devised and installed a personnel system in the United States Army, for which he received the Distinguished Service Medal. He was the author of "The Theory of Advertising" (1903); "The Psychology of Advertising" (1908); and "Increasing Human Efficiency" (1911).

SCOTT, WINFIELD, an American military officer; born near Petersburg, Va., June 13, 1786; was educated at



GENERAL WINFIELD SCOTT

William and Mary College, and studied law. In 1808 he was appointed captain of light artillery in General Wilkinson's division, stationed at Baton Rouge, La.; but was suspended for having accused his general of complicity with the conspiracy of Aaron Burr. At the commencement

of the War of 1812 he was appointed lieutenant-colonel and fought at Queenstown Heights. In 1813 he was promoted adjutant-general; in 1814, brigadier-general and brevet major-general. On July 3 he took Fort Erie, on the 5th fought the battle of Chippewa, and 20 days after, that of Lundy's Lane. He took part in the operations against the Seminoles and Creeks (1835-1837), in the Nullification disturbances in South Carolina, and in the Canadian revolt of 1837-1838. In 1841 he was appointed commander-in-chief of the United States Army, and in 1846 commanded in the Mexican War. In 1847 he won the victories of Vera Cruz, Cerro Gordo, Jalapa, Perote, Puebla, Contreras, Churubusco, Molino del Rey and Chapultepec, and seized Mexico, Sept. 14. The same year he was brevetted lieutenant-general. In 1859 he was a commissioner to settle the San Juan dispute with Great Britain; and in 1852 was the unsuccessful candidate of the Whig party for the presidency. In 1862 he retired from the army, retaining, by special act of Congress, his pay and allowance. General Scott compiled the "General Regulations of the Army," and translated and adapted from the French the system of "Infantry Tactics" which was used as the textbook of the army. In 1864 he published his "Autobiography." He died in West Point, N. Y., May 29, 1866.

SCOTTDALE, a borough of Pennsylvania, in Westmoreland co., on the Pennsylvania and the Baltimore and Ohio railroads. It is the center of an important coke industry, and it has also steel and iron mills, brass works, silver works, a casket factory, machine shops, etc. Pop. (1910) 5,456; (1920) 5,768.

SCOTTI, ANTONIO, an Italian operatic baritone, born at Naples, Italy, in 1866. He studied under Madame Paganini and made his first appearance at the Teatro Reale, Malta, in 1889. After singing for 10 years on the stages of many Italian theaters, as well as in Madrid, St. Petersburg, Moscow, Warsaw, and South America, he sang in "Don Giovanni" in London, in 1899, under the management of Maurice Grau, who immediately engaged him for his New York Metropolitan Opera Company. Since then he has appeared regularly each season in the United States, where he acquired a high reputation and where he sang leading parts in many of the best known operas. His home was at Naples.

SCOTTISH ACADEMY, ROYAL, an institution for the promotion of the fine arts, formed at Edinburgh, Scotland, in 1826. Sculpture and painting are the two arts receiving most attention and the Academy, which was incorporated in 1838, and was organized on the plan of the English Royal Academy, was housed at first in the building of the Royal Institution and there held its annual exhibitions. Later arrangements were made by which the exhibition of painting and sculpture of the Royal Scottish Academy were held in the National Gallery. Apart from the exhibitions, the Academy maintains schools and these also are conducted in the National Gallery.

SCOTUS ERIGENA, JOHANNES (skō' tus e-rij'-enä), a renowned mediæval philosopher of the 9th century. He was an Irishman, as indicated by the surnames Scotus (which in that age meant Irish) and Erigena (of Irish extraction). His life seems to have been passed mostly in France. He was a Platonist rather than an Aristotelian. His greatest work is "Of the Division of Nature," in which he holds for the identity of philosophy and religion, and repels the claim of authority in matters of religious belief.

SCRANTON, a city and county-seat of Lackawanna co., Pa.; on the Lackawanna river, and on the Lackawanna, the New York, Ontario, and Western, the Erie, the Delaware and Hudson, and the Central of New Jersey railroads; 18 miles N. E. of Wilkes-Barre. The city is the third largest in the state in population, and is the heart of the extensive anthracite coal section. It is built on a plateau in the Lackawanna valley amid beautiful scenery.

Business Interests.—Scranton has a large general trade, and is one of the chief points for the shipment of anthracite coal. The manufacture of iron and steel forms the principal industry. In 1920 there were 4 National banks in operation, and many daily, weekly, and monthly periodicals.

Public Interests.—The city has an area of over 20 square miles; over 150 miles of streets, and an excellent sewer system. The streets are lighted by electricity. There is a public school enrollment of over 20,000 pupils, and annual expenditures for public education of about $500,000. The city is laid out with wide streets; and has many driveways, squares, and parks. Among the public buildings are a court house, United States Government building, Museum of Natural History, Moses Taylor Hospital, State Hospital, Y. M. C. A. building, International Correspondence Schools, Masonic Temple, public library, etc. There are several colleges and academies. Besides the coal industry there are manufactures of knit-goods, lace, locomotives, silk, nuts and bolts, etc.

History.—The city was established in 1840 by George W. and Joseph H. Scranton. It was made a borough in 1854, and was chartered as a city in 1866. Pop. (1910) 129,867; (1920) 137,783.

SCREAMER, in ornithology, a popular name for any individual of the South American family *Palamedeidæ*. They have a horn on the forehead, and strong

HORNED SCREAMER

spurs on their powerful wings. They are gentle and shy, and the crested screamer (*Chauna chavaria*) is said to be domesticated, and to defend the poultry of its master from birds of prey. *Chauna derbiana* is the derbian screamer, and *Palamedea cornuta* the horned screamer.

SCREW, in mechanics, a cylinder surrounded by a spiral ridge or groove, every part of which forms an equal angle with the axis of the cylinder, so that if developed on a plane surface it would be an inclined plane. The screw is considered as one of the six mechanical powers, but is really only a modification of the inclined plane. A convex screw is known as the external or male screw, a concave or hollow screw (generally termed a nut) is an internal or female screw. The mechanical effect of a screw is increased by lessening the distance between the threads, or by making them finer, or by lengthening the lever to which the power is applied; this law is, however, greatly modified by the friction, which is very great. The parts of a screw are the head, barrel or stem, thread, and point. The head has a slit, nick, or square. In number screws vary, as single, double, triple; the numbers representing the individual threads, and those above single being known as multiplex-threaded. A right and left screw is one in which the threads on the opposite ends run in different directions.

SCREW PROPELLER, a spiral blade on a cylindrical axis, called the shaft or spindle, parallel with the keel of vessels, made to revolve by power beneath the surface of the water, usually at the stern, as a means of propulsion. In 1802, Shorter, an English mechanician, produced motion through the water by means of a screw, but his discovery had no practical value, and it was not till 1837 that its practicability was demonstrated by the American inventor, Captain Ericsson, since which time the screw has steadily gained in favor as a means of propulsion for vessels all over the world. In 1860 the first steamer operated by twin-screws was constructed by Messrs. Dudgeon of London, England.

SCRIBE (Hebrew, *sofer*), among the Jews, originally a kind of military officer, whose business appears to have been the recruiting and organizing of troops, the levying of war-taxes, and the like. Later the Hebrew name *sofer* seems to have been especially bestowed on a copyist of the law books. After the exile, under Ezra, apparently the copyist became more and more an expounder of the law. In Christ's time the name had come to designate a learned man, a doctor of the law. Christ himself recognizes scribes as a legal authority (Matt. xxiii. 2); they were the preservers of traditions, and formed a kind of police in the Temple and synagogues, together with the high priest; and the people reverenced them, or were expected to reverence them, in an eminent degree. They were to be found all over the country of Palestine, and occupied the rank and profession of both lawyers and theologians. Their public field of action was probably threefold: they were either assessors of the Sanhedrim, or public teachers, or administrators and lawyers. Many of these teachers had special class-rooms somewhere in the Temple of Jerusalem, where the pupils destined to the calling of a rabbi sat at their feet. The calling of a scribe being gratuitous, it was incumbent on every one of them to learn and to exercise some trade. As a rule they were PHARISEES (*q. v.*), and zealous to keep the law pure from any foreign influence. Among famous scribes are to be reckoned Hillel, Shammai, and Gamaliel.

SCRIBE, AUGUSTIN EUGÈNE (skrēb), a French dramatist; born in Paris, Dec. 24, 1791. For nearly 40 years he was the most conspicuous playwright living. His collected "Œuvres" (76 vols., issued 1874-1885) contain all his works,

which include novels as well as plays. Among his best-known plays are: "Valeria" (1822); "The Glass of Water" (1840); "Adrienne Lecouvreur" (1849); "The Queen of Navarre (1850); "The Ladies' Battle" (1851); and "Fairy Fingers" (1858): the last three with Legouvé. He also wrote "Fra Diavolo," "Robert the Devil," "The Huguenots," "The Prophet," "La Favorita," and many other well-known librettos. He died in Paris, Feb. 20, 1861.

SCRIPTURE, EDWARD WHEELER, an American psychologist; born in Mason, N. H., May 21, 1864; was graduated at the College of the City of New York in 1884; pursued special studies abroad; returned to the United States and was made director of the psychological laboratory of Yale University. He was lecturer at Johns Hopkins in 1906, and lecturer on psychiatry at Columbia in 1909. His investigations resulted in several important discoveries, including a method of producing anæsthesia by electricity, a method of measuring hallucinations and imaginations, and the law of "mediate association of ideas." He also invented a color-sight tester by which color-weak or color-blind persons employed in lamp batteries, marine or railroad service, can be detected. His publications include: "Thinking, Feeling, Doing" (1895); "The New Psychology" (1897); "Introduction to Experimental Phonetics" (1906), etc.

SCROFULA ("king's evil"), a tedious disease, tubercular in its nature, one of the most characteristic marks of which is a tendency to swelling of the glandular parts, which sometimes suppurate, and discharge a curdy, mixed matter, and are very difficult to heal. The persons in whom scrofulous disease is most apt to manifest itself are marked during childhood by pale and pasty complexions, large heads, narrow chests, protuberant bellies, soft and flabby muscles, and a languid and feeble circulation. It, however, often accompanies a variety of the sanguineous temperament also, and is indicated by light or red hair, gray or blue eyes, with large and sluggish pupils, and long, silky lashes, a fair, transparent brilliancy of skin, and rosy cheeks. This red color is, however, easily changed by cold to purple or livid, and the extremities are subject to chilblains. It is frequent, also, though less common, in what is called the melancholic or bilious temperament, *i. e.*, in persons of dark, muddy complexion and harsh skin, in whom the mental and bodily energies are more sluggish and dull. It is one of those diseases that are in a very marked degree hereditary. Among the exciting causes are insufficient nutriment, exposure to wet and cold, impurity of the atmosphere, the want of natural exercise, and mental disquietude. Climate exercises a very marked influence upon it. A moist, cold, and variable climate is particularly favorable to its development, while on the other hand a hot or a very cold climate protects against it.

It usually manifests itself in indolent glandular tumors, frequently in the neck, at first free from pain and inflammation, but proceeding slowly to an inflammatory state, and gradually and generally, after a long time, forming an ulcer, which is extremely difficult to heal. In some cases the eyes and eyelids are the principal seat of the disease, having constantly a very inflamed aspect. The bones of scrofulous persons are also liable to disease, especially those of the spine. The lungs are particularly liable to attack in such cases, giving rise to the formation of tubercles in that organ which is so marked a feature in phthisis.

SCUDDER, HORACE ELISHA, an American author; born in Boston, Mass., Oct. 16, 1838. From 1890-1898 he was editor of the "Atlantic Monthly." He published: "Seven Little People and Their Friends"; "Dream Children"; "Stories from my Attic"; "Stories and Romances"; "Boston Town"; "Life of Noah Webster"; "A Short History of the United States"; "A History of the United States"; "Fables and Folk Stories"; "George Washington: An Historical Biography"; "Men and Letters"; "The Bodley Books"; "Life of Bayard Taylor"; "Recollections of Samuel Breck"; "Literature in School"; "The Children's Book," etc. He died in 1902.

SCUDDER, SAMUEL HUBBARD, an American naturalist; born in Boston, Mass., April 13, 1837; was graduated at Williams College in 1857 and at the Lawrence Scientific School in 1862; was assistant to Prof. Louis Agassiz at the Cambridge Museum of Comparative Zoölogy in 1862–1864; secretary of the Boston Society of Natural History in 1862-1870; and its president in 1880-1887. He was palæontologist of the United States Geological Survey in 1886-1892. His publications include: "A Century of Orthoptera" (1879); "Catalogue of the Scientific Serials of All Countries" (1879) "Butterflies, Their Structure, Changes, and Life Histories" (1881); "Butterflies of the Eastern United States and Canada" (1889); "Catalogue of the Described Orthoptera of the United States and Canada" (1900); etc. He died in 1911.

SCUDDER, VIDA DUTTON, an American educator and writer, born in southern

India, in 1861. She graduated from Smith College in 1884 and took post-graduate studies at Oxford and in Paris. From 1882 to 1910 she was associate professor of English literature at Wellesley College, and from 1910 was full professor of this branch. She wrote "Social Ideals in English Letters" (1898); "The Disciple of a Saint" (1907); "Socialism and Character" (1912); "Church and the Hour" (1917), and edited many English texts.

SCULPTURE, the art of cutting or carving any material so as to represent form. Sculpture may be broadly divided into relievo and round. In the former, single figures or groups are represented as more or less raised, but without being entirely detached from a background. According to the latter method, insulated figures, such as statues, or collections, or groups, are made, so as to be entirely independent of a background.

The origin of sculpture is lost in antiquity. An admirable material for early effort was found in clay, so widely diffused in many lands, to which, as knowledge advanced, were added wax, gesso, marble, alabaster, bronze, etc. Hence the rudiments of sculpture are found among all races of mankind. The idolatry of the Old World gave it a great impulse, from the necessity which it produced of representing gods. The history of sculpture is almost the history of religion. In the inspired writings, the Israelites are repeatedly exhorted to turn away from the worship of images, the sculptured works of their own hands. Sculptured works have been found in the most ancient Hindu caverns and grotto temples. In the ruins of Persepolis there are many examples attesting to the fact that the Persians possessed many works of sculpture, yet they never carved the semblance of the human form. Sculpture flourished in Assyria. The museums of London and Paris contain colossal slabs, the dates of which range from the time of Sardanapalus, 930 B. C., to the destruction of Nineveh, 625 B. C. The Egyptians were the first who elevated sculpture almost to pure art. In Greece the art of sculpture soon rose superior to all those impediments which trammeled and restricted its advancement in other countries.

The Greeks had an intuitive sympathy with beauty, either in poetry, painting, or sculpture. Sculpture in Greece, as elsewhere, had its beginning in very rude forms. At first the symbols of divinity were little more than rude quadrangular blocks of stone. Between the 9th and 7th centuries B. C. the Greeks had frequent intercourse with the commercial Phœnicians. From this nation the Greeks borrowed their Hermæ, or god of roads and travelers; at first mere stone pillars. On these pillars a head was afterward carved, thus forming the origin of busts. Hands and feet were next added, a shield and spear were placed in the hands of the statues; and thus the first semblance of Pallas originated. Till the time of Dædalus of Athens, the bodies or trunks of large statues were a mere cylindrical pillar, as in the Colossus of the Amyclean Apollo. Progressing still further, sculpture was called on to assist in the decoration of temples. Dædalus inaugurated a new era; and of his divine genius the Greeks said that he made statues walk, see, and speak. After this great master it was that all artists were symbolically termed Dædalides, the sons of Dædalus. Henceforth, ancient Greek art may be divided into two styles: the Old Attic, and the Æginetic. However, the true, the ideal style of Greek art was not inaugurated till the time of Phidias. This great genius lived in the time of Pericles, the age of classic models. For the Parthenon at Athens, Phidias wrought the statue of Minerva, and at Elis he set up his other great masterpiece, the famous Olympian Jupiter. Both were executed in ivory and gold. The god Jupiter was 40 feet high. This statue existed till the year 475 of our era, when it was destroyed by fire at Constantinople. Besides these great works he made a statue of Pallas in brass, for Athens, the Venus Urania, the Nemesis in the temple at Marathon, and an Amazon, famed throughout Greece for the beauty of her limbs. Alcamenes of Africa, and Agoracritus of Paros, were his favorite disciples. The most famous works of Alcamenes were his Mars, Cupid, Venus, and Vulcan. It was said that Agoracritus was even superior to Alcamenes, and when he contended with the latter in the execution of a statue of Venus the Athenians only adjudged the prize to Alcamenes out of partiality for their fellow-citizen. According to Varro, the Venus of Agoracritus was the finest ever wrought. Polycletus of Argos was the author of the work deemed worthy of being ranked as the companion to the Jupiter of Phidias. This was the celebrated statue of Juno. Myron of Eleutheræ, in Bœotia, was the great rival of Polycletus. Despising the soft and graceful forms which his contemporary sculptor loved to represent, Myron sought his models in the brawny athlete. He sculptured the ideal Hercules, the Discobolus throwing the discus. In one quality, however, he was surpassed by Pythagoras of Rhegium, who executed the ideal of Apollo, who, as an archer, has just shot the serpent Python. The finest statue possessed by the moderns is

an imitation of this great work, the Apollo Belvidere.

With Socrates, the sculptor of the Draped Graces, and Athenodorus and Nancydes, commenced the third epoch of Greek sculpture. It is generally known as the beautiful style, and Scopas, Lysippus, and Praxiteles, because they united beauty and grace, brought the art to its highest perfection. The finest works of Scopas were the Furious Bacchante, his Venus (the original, perhaps from which the Venus de Medici was copied), and the Triumph of Achilles, together with a number of charming combinations of Nereids and sea monsters. PRAXITELES (*q. v.*) wrought in bronze and marble. Till this sculptor ventured to carve a Venus nude, all statues of female divinities had been draped. The rival and contemporary of Praxiteles was Lysippus of Sicyon, who was the great master of portrait sculpture. He is said to have executed in bronze exclusively. Alexander the Great would permit no other artist to carve his likeness. He represented Alexander from his childhood to his manhood. Pliny declares that Lysippus executed as many as 610 works. His horses were very beautiful. The other great sculptors of this period were Euthycrates and Bedas, sons of Lysippus; Xenocrates, who wrote a treatise on sculpture; Chares of Lindus, who cast the famous Colossus of Rhodes; Agesander, Polydorus and Athenodorus of Rhodes, who executed the celebrated group of Laocoön; Glycon of Athens, who formed the Farnese Hercules at Naples; and Appollonius and Tauriscus, who made the Farnese Bull, also at Naples. The beautiful fragment known as the Torso of the Belvidere, at Rome, and the Hermaphrodite at Paris, also belong to this era of Greek art. From an early period, and even during the best era of Greek art, the age of Phidias, the Greeks were accustomed to combine different marbles in the same work. The Greeks also painted their statues. The hair was often gilt, and even colored sometimes; the backgrounds of alti-relievi were painted in order to heighten the effect, and occasionally eyes of glass or silver were introduced.

The victorious Romans destroyed the existence of the arts in Greece; but all the great works in painting and sculpture were taken to Rome, and with these masterpieces the artists emigrated to the capital of their conquerors. The celebrated reclining statue of the Dying Cleopatra was executed in the reign of Augustus, and a son of Cleomenes the Athenian made a statue which is held by some to be a figure of Germanicus. This work is now in the Louvre at Paris. Sculpture flourished under the patronage of Julius Cæsar, Augustus, Nero, Trajan, Adrian, and the Antonines. After Rome had been destroyed by the several inroads of the Northern nations, the finest productions of ancient art were demolished, and this work of destruction was consummated by the religious zeal of the primitive Christians, who swept away what remains there were of the statues of the Greek and Roman divinities.

Sculpture awoke to renewed life about the 10th or 11th century in Italy. Niccolo Pisano, who died 1278, is esteemed the "father of modern sculpture." Two of his finest compositions are the "Taking down from the Cross," in front of the Duomo of Luca, and the "Last Judgment and Punishment of the Wicked," in the cathedral of Siena. Luca della Robbia covered his beautiful terra-cotta models with a glaze which gave them the hardness of stone. Lorenzo Ghiberti and Donato di Betto Bardi (Donatello) were distinguished masters of sculpture. Donatello (died 1466), enriched Florence, Genoa, and Venice with his works. During the 15th century Andrea Verrocchio, Andrea Ferracci, the two Pollajuoli, and Mino di Fiesole, were great masters. Michelangelo Buonarotti was the greatest sculptor of this period. Baccio Bandinelli, born at Florence in 1493, attempted to become the rival of Michelangelo. A great anatomist, his style was rude and energetic. He restored the right arm of the Laocoön. Benvenuto Cellini was a Florentine sculptor; most of his finest large works, which were cast in bronze, are preserved in his native city. The one celebrated female sculptor is Properzia di Rossi, of Bologna, who died at an early age in 1530.

To Flaxman, the English are indebted for founding on true principles the British school of sculpture. This great sculptor has had worthy followers in Sir R. Westmacott, Sir F. Chantrey, Bailey, Carew, Gibson, and Foley, Woolner, and Boehm. Other important British sculptors are Leighton, Simonds, Brock, Thornycroft, Ford, Frith, Gilbert, and Frampton. In France, Jean Goujon (died 1566) is the first distinguished sculptor. In the 17th century we have the brothers Marsy, Girardon, Falconet, Clodion, also Guillain, Franqueville, Anguier, and Puget. Of 18th century masters are Jean Antoine Houdon, Antoine Chaudet, J. Bosio, Pradier, Rude, Duvet, etc. Jean Baptiste Pigalle (died 1785), executed a Mercury and a Venus for the King of Prussia. David (d'Angers) and Pradier belonged to the French school of the 19th century, and, among later sculptors, Guillaume, Carpeaux, Bartholdi, Dubois, Chapu, Mercie, Barge, Fremiet, Dalou, Falquière, Rodin, Bartholomé, Delarche and Wynant take high rank.

Among modern German sculptors, Christian Rauch and Dannecker take high rank. Famous sculptors of more recent times are Schadow, Schilling, Begas, Stuck, Klinger, and Seffner. As Canova emancipated modern Italy from those false perceptions which had so long diverted the current of pure taste, so Thorwaldsen, the Danish sculptor, was superior to all his contemporaries in the grandeur of his form and in strength of expression. John Gibson was the most distinguished pupil of both Canova and Thorwaldsen. Few American sculptures worthy of note were executed previous to Greenough's time, but since his day the names of Hiram Powers, Crawford, Brown, Clevenger, Palmer, Miss Hosmer, Story, Saint Gaudens, Ward, MacMonnies, French, Hartley, Partridge, Manship, Herbert Adams, Bartlett, Bitter, Nichaus, Proctor, Barnard, Borglum, Lorado Taft, Akin, Aitken, French and Werneman have been added to the list of American sculptors.

SCURVY, or **SCORBUTUS**, a disease characterized by a depraved condition of the blood. In consequence of this morbid state of the blood there is great debility of the system at large, with a tendency to congestion, hemorrhage, etc., in various parts of the body, and especially in the gums.

The first effect of the disease is generally a decline in the general health, and the patient becomes depressed, is easily fatigued, and has a peculiar sallow complexion. After a variable period, the more characteristic symptoms appear, the chief of which are hemorrhages and sponginess of the gums. The hemorrhages closely resemble those of purpura and occur into and under the skin, where they give rise to red or purple discolorations which change color like the marks of bruises; into the muscles and other deeper tissues, where they cause brawny swellings; and into internal organs or cavities. Hemorrhage also frequently takes place from the mucous membranes of the nose and alimentary canal. The affection of the gums is still more characteristic, and is rarely absent, except in the very young or very old who are without teeth. The gums are swollen, discolored, detached from the teeth, and bleed very easily, while the breath becomes very fetid. This combination sometimes precedes but often follows the occurrence of hemorrhage in other situations.

The cause of scurvy is now well known to be an improper diet. The disease is never known to have occurred in any one who had eaten freely and habitually of fresh vegetable food. Even preserved vegetables, if kept in a juicy condition, prevent the occurrence of the disease. Fresh meat and, in a less degree, milk are antiscorbutic. An efficient protective is lemon or lime juice; and the constant use of the latter during long voyages undoubtedly prevents the occurrence of scurvy when it would otherwise be inevitable.

SCUTARI (skö'tä-rē), a town of Asiatic Turkey, situated opposite Constantinople, on the banks of the Bosphorus, in Asia Minor. Its site is beautiful, and fine views of Constantinople and the surrounding scenery are obtained from the hills above. It has a palace and gardens belonging to the Sultan, a college of dervishes, a college for girls (conducted by Americans), barracks, public baths, and extensive cemeteries, used by the Turks of Constantinople, from their belief that the soil of Asia is more sacred than that of Europe. There is also a densely filled English burial ground containing Marochetti's monument in honor of 8,000 nameless British soldiers of the Crimean War (1854-1856). Scutari was the scene of Florence Nightingale's labors during this war. It carries on a considerable trade, being a rendezvous for the caravans which come from the interior of Asia. Pop. about 100,000.

SCUTARI, a town in Albania, capital of the province of the same name, situated on the river Drin, where it is joined by the Boyana, and on the Lake of Scutari, a sheet of water eight miles in length and six miles broad, connected with the Adriatic by the Boyana. Scutari was attacked by the Montenegrins in the Balkan War of 1912, and was by them besieged during the entire period of the war, but was heroically defended by Essad Pasha. Pop. about 32,000.

SCYLLA (sil'la), in classical mythology, a daughter of Nisus, King of Megara. When Minos came from Crete to take vengeance for the death of his son, Androgeos, his efforts to take the city were fruitless as long as the purple lock on the head of Nisus remained unshorn. Urged by her love for Minos, Scylla cut off the fatal lock, and with it destroyed the life of her father and the safety of the city. According to one version Minos tied Scylla to the stern of his ship and drowned her; but another tale says that she was changed into a fish, which Nisus, transformed into an eagle, constantly pursued. The myth was localized in the names of the port of Nicæa and the promontory Scyllæum. The "Odyssey" (xii. 73) speaks of another Scylla, a daughter of Cratæis, as a monster with

12 feet, six necks, and six mouths, each containing three rows of teeth. This being haunted a rock on the Italian coast; a neighboring rock being tenanted by Charybdis, who thrice every day swallowed the waters of the sea, and thrice threw them up again. Like Medusa, Scylla is represented in some legends as having been beautiful, and as having been changed into a monster through the jealousy of Circe or Amphitrite.

SCYLLA, and CHARYBDIS (kar-ib' dis), the former a famous promontory and town of southern Italy, at the entrance to the narrow strait separating Italy from Sicily. The promontory is 200 feet high, projecting into the sea, and at its base is the town. The navigation at this place was looked upon by the ancients as attended with immense danger. At the present day the risk is not more than attends the doubling of an ordinary cape. Charybdis (modern name Galofaro) is a celebrated whirlpool in the Straits of Messina, nearly opposite the entrance to the harbor of Messina in Sicily, and in ancient writings always mentioned in conjunction with Scylla. The navigation of this whirlpool is, even at the present day, considered to be very dangerous.

SCYTHE, an implement which has been known from the earliest ages. The ancient form being nearly the same as the modern. It consists of a curved steel blade fixed at right angles to a long, crooked handle, to which are fastened two other smaller handles. One of the first American inventions was an improvement in the scythe, originated by Joseph Jenks, who strengthened the back edge of the blade by welding to it a strip of iron. Scythes are used for cutting grass and corn; when for the latter purpose, a piece of wickerwork, called a cradle, is attached. In antiquity, the curved, cutting blade, which was affixed to the wheels of war chariots, was called a scythe. The implement in its agricultural form was an emblem of Saturn or Chronos or old "Father Time."

SCYTHIANS, a name very vaguely used by ancient writers. It was sometimes applied to all the nomadic tribes which wandered over the regions to the N. of the Black and the Caspian Seas, and to the E. of the latter. In the time of the Roman empire the name Scythia extended over Asia from the Volga to the frontiers of India.

SEA, a general name for the great body of salt water which covers the greater part of the earth's surface; the ocean. In a more limited sense the term is applied to a part of the ocean which from its position or configuration is looked upon as distinct and deserving of a special name, as the Mediterranean Sea, the Black Sea, etc. The term is also occasionally applied to inland lakes, as the Caspian Sea, the Sea of Galilee, etc.

Area.—The waters of the sea cover about 130,000,000 square miles, or about two-thirds of the surface of the earth. The areas of the main division of the ocean are estimated as follows:

	Sq. miles
Pacific (from Arctic Circle to 40° S.)	63,986,000
Atlantic (from Arctic Circle to 40° S.)	31,530,000
Indian (S. boundary 40° S.)	28,350,000
Arctic (within the Arctic Circle)	5,541,000
	129,407,000

Depth.—The solid globe or lithosphere, viewed as to its superficial aspect, may be regarded as divided into two great planes; one of these corresponds to the dry land or upper surface of the continental masses, and occupies about two-seventh of the earth's surface; the other, corresponding to the abysmal regions of the ocean, is depressed over 2½ miles below the general level of the continental plane, and occupies about four-sevenths of the earth's surface. The transitional area, uniting these two planes, forms the sides or walls of the ocean basins, and occupies about one-seventh of the earth's surface. The depressed regions of the globe, represented by the ocean basins, are filled with sea water up to within about 375 fathoms (2,250 feet) of the general level of the continents, the average depth of the water in the ocean basins being on the other hand about 2,080 fathoms (12,480 feet). The average depths of the main divisions of the ocean are:

Pacific Ocean	13,438 feet
Atlantic Ocean	13,654 "
Indian Ocean	12,887 "
Arctic Ocean	3,837 "

The greatest depth hitherto recorded is 5,269 fathoms or 31,614 feet in the Pacific near the island of Guam. In the Atlantic the greatest depth is 4,561 fathoms, off Porto Rico. Ross records a sounding in the Antarctic ocean where he found no bottom at 4,000 fathoms. By far the larger portion of the sea floor lies between the depths of 1,000 and 3,000 fathoms, equal to nearly 78 per cent., while about 17½ per cent. is found in depths less than 1,000 fathoms, and about 4½ per cent. in depths greater than 3,000 fathoms. The bulk of water in the

whole ocean is estimated at 315,000,000 cubic miles.

Temperature.—The temperature of the surface waters of the ocean varies from 28° F. in the polar regions to 85° or 86° in equatorial regions. In many places the surface layers are subject to great annual changes due to the seasons and the direction of the wind. The temperature of the water at the bottom of the ocean over the abysmal areas ranges from 32.7° F. to 36.8° F. The great mass of the ocean consists of cold water —*i. e.*, of water below 40° or 45° F.; at a depth of little over half a mile the water in the tropics has generally a temperature below 40° F. In the open ocean the temperature usually decreases as the depth increases, the coldest water being found at the bottom. In inclosed or partially inclosed seas, cut off by barriers from the great ocean basins, the temperature remains uniform from the height of the barrier down to the bottom; for instance, in the Mediterranean the temperature is about 56° from 200 fathoms down to 2,000 fathoms.

Circulation.—The circulation of oceanic waters is maintained by the action of the prevailing winds and by other causes. In the oceanic areas the prevailing winds are governed by the large anticyclonic areas situated toward the centers of the north and south Atlantic and north and south Pacific. The winds blow out from and around these anticyclonic areas. For instance, in the Southern Hemisphere the warm salt water of the tropical regions is driven to the S. along the E. coasts of South America, Africa, and Australia, till on reaching a latitude of between 50° and 55° S. it sinks on being cooled and spreads slowly over the floor of the ocean to the N. and S. A similar circulation takes place in the northern hemisphere, though much modified by the peculiar configuration of the land masses; for instance, the cold salt water at 30° F. which occupies the deeper parts of the Arctic basin is largely made up of the dense Gulf Stream water, which sinks to the bottom on being cooled in the Norwegian Sea. The water evaporated from the sea surface is borne to the land masses and condensed on the mountain slopes. The saltiest waters are found in the regions of greatest evaporation; for instance, in the Red Sea, Mediterranean, and in the trade-wind regions of the great ocean basins.

Composition of Sea Water.—It is probable that every element is in solution in sea water, the great majority, however, present only in exceedingly minute traces. If the average density of sea water be taken at 1,027, pure water being 1,000, then the following would represent the composition of 1,000 cubic centimeters of sea water:

Sodium chloride	28.9980
Magnesium chloride	4.0568
Magnesium sulphate	1.7665
Calcium sulphate	1.3425
Potassium sulphate	0.9193
Magnesium bromide	0.8809
Calcium carbonate	0.1287
Water	989.7073
	1027.0000

Each base is probably in combination with each acid, so that there are really 16 salts altogether from the mixture of the four bases and four acids. The total amount of sea salts may vary greatly in different samples of sea water, but it has been shown by hundreds of carefully conducted experiments that the ratio of the constituents of sea salts is nearly everywhere constant, with one significant exception, that of lime, which is in slightly greater proportion in the water from the deeper parts of the ocean basins. Nitrogen remains at all times and places nearly constant; not infrequently the proportion of oxygen is much reduced in deep water, owing to the process of oxidation and respiration. Carbonic acid free or loosely combined is abundant, and plays a most important rôle in the economy of the ocean, combining with and rendering soluble normal carbonates of lime and magnesia to solution in the form of bicarbonates. Water, as is well known, is but slightly compressible, and almost any substance that will fall to the bottom of a tumbler of water will in time fall to the bottom of the deep ocean. Still the compressibility of water must not be neglected in oceanographical questions. In the deeper parts of the ocean the pressure amounts to four or five tons per square inch; hence, in an ocean with a depth of 5 miles, were the action of gravity suddenly to cease, the ocean waters would rise 500 feet above their present level from expansion.

Life.—The color of pure sea water is a light shade of blue; it has, however, frequently various shades of green and brown, owing to the presence of organisms and matters in suspension. It has been definitely established that life in some of its many forms is universally distributed throughout the ocean. It has long been known that marine plants and animals abound in the shallow waters surrounding continents and islands. Algæ disappear from the sea-bed at depths between 100 and 200 fathoms, but a great abundance of animals have been procured in the greater depths. The term "Benthos" is now used for all the animals and plants which live attached to or creep over the bottom of the ocean, "Plankton" being the term for all the plants and ani-

mals which live in, and are carried along by the currents of the ocean. In the great body of oceanic waters life is most abundant in the surface and sub-surface waters down to about 100 fathoms. Pelagic algæ, such as diatoms and oscillatoria, are abundant in this region, and are the principal and original source of food for many pelagic and nearly all deep-sea animals. In the intermediate depths of the ocean life though present is less abundant.

Deposits.—All marine deposits may be divided into two classes—viz., those made up principally of the débris from the solid land of the globe, laid down in greater or less proximity to the shores of continents and islands, called "terrigenous" deposits, and those in which this continental débris is nearly or quite absent, laid down in the abysmal regions of the ocean, called "pelagic" deposits. Commencing with the former, there are first the littoral and shallow-water deposits, forming around the land masses from the shore down to a depth of about 100 fathoms, consisting of sands, gravels, and muds derived almost entirely from the disintegration of the neighboring lands. The littoral deposits, laid down between tide marks, cover about 63,000 square miles, and the shallow-water deposits, between low-water mark and 100 fathoms, about 10,000,000 square miles. Proceeding seaward from an average depth of about 100 fathoms, the deposits gradually change in character, the proportion of land detritus decreasing, while the remains of oceanic organisms increase in abundance till at a considerable distance from land and in comparatively deep water the terrigenous deposits pass insensibly into truly pelagic deposits. The terrigenous deep-sea deposits—*i. e.*, those formed at depths greater than 100 fathoms—may be briefly summarized as follows:

Blue mud, the most extensive, is grayish or bluish in color, with usually a thin reddish upper layer, and is characterized by the presence of fragments of rocks and mineral particles coming from the disintegration of the land. Blue mud is found along the coasts of continents and continental islands, and in all inclosed and partially inclosed seas. Blue mud is estimated to cover about 14,500,000 square miles of the earth's surface—4,000,000 in the Arctic, 3,000,000 in the Pacific, 2,500,000 in the Antarctic, 2,000,000 in the Atlantic, 1,500,000 in the Indian, and 1,500,000 in the Southern ocean. Red mud covers about 100,000 square miles off the coast of Brazil.

Green mud and sand are similar to the blue muds, but are characterized by the presence of the mineral glauconite in isolated grains or in small concretions; the dead shells of calcareous organisms are usually filled with the glauconite, which gives the green color to the deposits. Green mud and sand cover about 850,000 square miles—300,000 in the Atlantic, 250,000 in the Pacific, 150,000 in the Indian, 90,000 in the Southern, and 60,000 in the Antarctic.

Volcanic mud and sand are deposited around the oceanic islands of volcanic origin and the name is derived from the presence of fragments and particles of volcanic rocks and minerals, which are larger and more numerous nearer the islands, when the deposit is called a sand. Volcanic mud and sand cover about 600,000 square miles—300,000 in the Pacific, 200,000 in the Atlantic, and 100,000 in the Indian ocean.

Coral mud and sand occur similarly around the oceanic coral islands and off those coasts and islands fringed by coral reefs. Coral mud and sand cover about 2,557,000 square miles—1,417,000 in the Pacific, 760,000 in the Atlantic, and 380,000 in the Indian ocean.

Of pelagic deposits there are five types, four of organic origin, receiving their designations from the distinctive presence of the remains of calcareous or siliceous organisms, the fifth and most extensive being of inorganic origin.

Globigerina ooze is so called from the presence of the dead shells of pelagic *Foraminifera*, those belonging to the genus *Globigerina* predominating, which live in the surface and sub-surface waters of the ocean, being especially abundant in tropical regions, and the shells of which after death fall to the bottom and there accumulate in moderate depths. The depth at which *Globigerina* ooze is found varies from less than 500 to over 2,500 fathoms, the average depth being about 2,000 fathoms. *Globigerina* ooze covers about 49,520,000 square miles—17,940,000 in the Atlantic, 11,300,000 in the Pacific, 10,560,000 in the Southern, and 9,720,000 in the Indian ocean.

Pteropod ooze resembles Globigerina ooze in all respects, except that there is a greater abundance of the dead shells of pelagic mollusca, such as pteropods and heteropods; it is usually found in lesser depths than the Globigerina ooze. Pteropod ooze covers about 400,000 square miles in the Atlantic.

Diatom ooze is distinguished by the presence of numerous remains of siliceous organisms, principally Diatoms, though fragments of siliceous sponge spicules and *Radiolaria* and *Foraminifera* are rarely absent. It is found in the Antarctic and Southern oceans and also in the northwest Pacific. Diatom ooze covers about 10,880,000 square miles—10,000,000 in the

Southern, 840,000 in the Antarctic, and 40,000 in the Pacific.

Radiolarian ooze in like manner contains a varying proportion of siliceous remains, in this case principally *Radiolaria* and their fragments. Calcareous organisms and mineral particles are nearly always present in both these oozes, being usually more numerous and the mineral particles larger in the diatom ooze than in the radiolarian ooze, which latter generally occurs in greater depths than the former. Radiolarian ooze covers about 2,290,000 square miles—1,161,000 in the Pacific, and 1,129,000 in the Indian ocean.

Red clay occupies nearly the whole of the deeper abysses of the ocean, occurring in its most characteristic form in the central regions of the Pacific, far removed from continental land. It is of a reddish or chocolate color, due to the presence of the oxides of manganese and iron. Mineral particles of secondary origin, arising from the decomposition of volcanic débris, are associated with the red clay, and in some regions of the central Pacific isolated crystals and spheroidal groups of phillipsite of secondary origin formed *in situ* make up a considerable quantity of the deposit. The presence of the remains of vertebrates, some of them belonging to extinct species lying alongside others belonging to existing species, as well as the formation of manganese nodules and zeolitic crystals *in situ*, and the presence of metallic and chondritic spherules of cosmic origin, appear to indicate that the red clay accumulates at a very slow rate. Red clay covers about 51,500,000 square miles—37,230,000 in the Pacific, 5,800,000 in the Atlantic, 4,350,000 in the Southern, and 4,120,000 in the Indian ocean.

SEA ANEMONE, the popular name given to a number of animals of the subkingdom Cœlenterata and class Actinozoa, including the genus *Actinia* and other genera. All sea anemones, however varied in coloration or form, present the essential structure and appearance of a fleshy cylinder, attached by its base to a rock or stone, and presenting at its free extremity the mouth, surrounded by a circlet of arms or tentacles. With these tentacles, which may be very numerous, in some cases exceeding 200 in number, they seize and secure their food—small crustacea, mollusks, such as whelks, etc. —which they paralyze by means of the thread cells common to them with all Cœlenterata. The mouth leads into a stomach sac. When fully expanded, the appearance of the anemones in all their varieties of color is exceedingly beautiful. But on the slightest touch the tentacles can be quickly retracted within the mouth aperture, the fluids of the body are expelled by the mouth, and the animal, from presenting the appearance of a fully expanded flower, becomes a conical mass of jelly-like matter. They are, most of them, diœcious, that is, having the sexes situated in different individuals. The young are developed within the parent body, and appear in their embryo state as free swimming ciliated bodies of an oval shape. The sea anemones resemble the *Hydræ* in their marvelous powers of resisting injuries and mutilation. They are eaten as food in Italy, Greece and on various coasts.

SEABURY, SAMUEL, an American clergyman; born in Groton, Conn., Nov. 30, 1729; was graduated at Yale in 1748; studied medicine at Edinburgh; and received deacon's and priest's orders in England in 1753. For some time he was a missionary of the S. P. G.; in 1757 he was promoted to the "living" of Jamaica, Long Island, and 10 years later to that of Westchester, N. Y. The Whigs, however, prevented his ministering, and once imprisoned him for six weeks at New Haven. He removed to New York, where he made his medical knowledge contribute to his support, acted as chaplain of the King's American regiment, and wrote a series of pamphlets which earned for him the special hostility of the patriots. On March 25, 1783, the clergy of Connecticut met at Woodbury and elected Seabury bishop; and for 16 months he waited vainly in London for consecration, the archbishops being indisposed to move without the sanction of the civil authority. On Nov. 14, 1784, he was consecrated at Aberdeen by bishops of the Scotch Episcopal Church. Bishop Seabury's jurisdiction embraced Rhode Island as well as Connecticut, and he acted also as rector of St. James' Church, New London. In 1792 he joined with three bishops of the English succession in consecrating a fifth, Bishop Claggett, through whom every American bishop derives from Seabury and the Scotch Church. Seabury secured to the episcopate its proper share in the government of the Church, and the restoration of the oblation and invocation to the Communion Office (from the Scotch Office). He died Feb. 25, 1796.

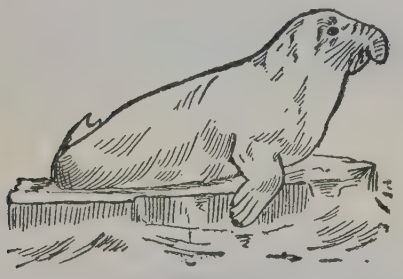
SEA EAGLE, a name applied to one or two members of the eagle family; but probably with most distinctive value to the cinereous or white-tailed eagle or erne, *Haliaëtus albicilla*, found in all parts of Europe. It is generally found inhabiting the seacoasts, and though living mainly on fish, yet makes inland jour-

neys in search of food, and seizes lambs, hares, and other animals. The head is covered with long drooping feathers of ashy brown color, while the body is of a dark-brown hue, streaked in some places

SEA EAGLE

with lighter tints, and having the primary feathers of the wing mostly black. The tail is rounded, and is of white color in the adult, but brown in the young bird. The bird feeds in Shetland and in the Hebrides. The American bald-headed eagle, *Haliaëtus leucocephalus*, from its frequenting the seacoasts is also named the sea eagle. See EAGLE.

SEA ELEPHANT, a large seal, called also bottle-nosed seal and seal elephant. It is the largest of the seal family, being larger than an elephant. The average length of the male is 12 to 14 feet, but some of 20 and 25 feet are mentioned.



SEA ELEPHANT

The female is generally about 10 feet long. It gets its name from its size and from its proboscis, which stretches out a foot or more, somewhat like the trunk of an elephant. The males are slaty-blue or brown, the female olive-brown above and yellowish below. Their hair is coarse and useless, but their thick skin makes good harness leather. The blubber yields a fine clear oil as good as sperm oil, without bad smell or taste. In England it is used for softening wool and in making cloth. The sea elephant was once found in abundance at Heard's Island in the southern Indian ocean, and at the Falkland and South Shetland Islands and other islands in the south Atlantic, and the coast of California. It is now rare.

SEAGER, HENRY ROGERS, an American economist, born at Lansing, Mich., in 1870. He graduated from the University of Michigan in 1890, and took post-graduate studies at the University of Pennsylvania, at Johns Hopkins, and in Germany and Austria. From 1897 to 1902 he was assistant professor of political economy at the University of Pennsylvania, and in 1905 became professor of the same branch at Columbia University. He wrote "Introduction to Economics" (1904); "Social Insurance" (1910); "Principles of Economics" (1917). From 1917 to 1919 he was secretary of the Shipbuilding Labor Adjustment Board in Washington.

SEA HARE, *Aplysia*, the name of a genus of gasteropodous mollusca. These animals are slug-like in appearance, and derive their popular name from the prominent character of the front pair of tentacles, which somewhat resemble the ears of a hare. The shell is either absent or is of very rudimentary character, and is concealed by the mantle. Four tentacles exist, and the eyes are situated at the base of the hinder tentacles. The sea hares are widely distributed throughout most seas, and generally inhabit muddy or sandy tracts. They emit a fluid of a rich purple hue. They are also known to discharge an acrid fluid of milky appearance, which has an irritant effect on the human skin. *A. hybrida* is the common British species.

SEA KALE, *Crambe maritima*, a perennial cruciferous herb, a species of colewort, called also sea cabbage. It is a native of the seacoasts of Europe, and is much cultivated in gardens as a table vegetable.

SEAL, an impression made on paper, clay, wax, or other substance, by means of a die of metal, stone, or other hard material. The stamp which yields the impression is frequently itself called the seal. The use of seals may be traced to the remotest antiquity. The Bible contains frequent allusions to them, and their use has been common in all the European states from the earliest historical periods. It is affixed to legal instruments so as to furnish evidence of their authenticity.

SEAL, in zoölogy, the family *Phocidæ* or seal tribe, are, of all four-limbed mammiferous animals, those which display the most complete adaptation to residence in the water. The head is round, and the nose, which is broad, resembles that of

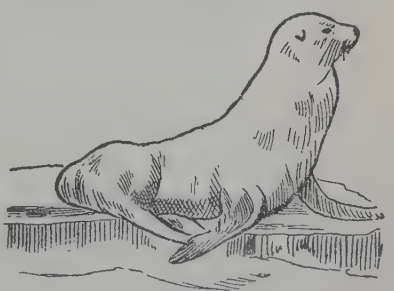
a dog, with the same look of intelligence and mild and expressive physiognomy. It has large whiskers, oblong nostrils, and great black sparkling eyes. It has no external ears, but a valve exists in the orifices, which can be closed at will, so as to keep out the water; the nostrils have a similar valve; and the clothing of the body consists of stiff glossy hairs, very closely set against the skin. The body is elongated and conical, gradually tapering from the shoulders to the tail. The spine is provided with strong muscles, which bend it with considerable force; and this movement is of great assistance to the propulsion of the body. Though furnished with the same number of bones as in quadrupeds, they are united to the body in such a singular manner, and so covered with a membrane, that they would rather resemble fins than feet, did not the sharp strong claws with which they are pointed show their proper analogy. The limbs, in fact, are converted into oars and paddles. The anterior pair have the arm and forearm so short, that little more than the paw advances from the body. The hinder limbs are directed backward, so as almost to seem like a continuation of the body; the thigh and leg are very short, and the foot is formed on the same plan as the forepaw, the toes being in contact, however, and the web folded, when it is not in use as a paddle, but being spread out when the animal is swimming. When on land, or on masses of ice, the movements of the seal are particularly awkward, its body being forced onward by the action of the forelimbs only, and the wriggling motion of the abdominal muscles. The seals live in herds, more or less numerous, along the shores of the sea; and on uninhabited coasts they bring forth and suckle their young, and exhibit the most tender solicitude for their welfare. They are easily tamed, become strongly attached to their keepers, recognize them at a distance, and seem to be endowed with a very considerable share of intelligence. The form of their teeth and jaws shows them to be carnivorous; and their food consists of fish, crabs, and sea birds, which they are enabled to surprise while swimming. Seals swim with great rapidity and ease. They can remain under water for a considerable time.

These animals produce two or three young at a time; and they suckle them for six or seven weeks, generally in the cavernous recesses of rocks, after which they take to the sea. The young are remarkably docile; they recognize and are obedient to the voice of their dams amid the numerous clamors of the flock, and mutually assist each other when in danger or distress. They continue to live in society, hunt and herd together, and have a variety of cries by which they encourage or pursue, express apprehension or success. When incited by natural desire, however, their social spirit seems to forsake them; they then fight most desperately; and the victorious male always keeps a watchful eye over those females whom his prowess has secured.

The common seal, *Phoca vitulina*, abundant in the cool and frigid regions, is three to five feet long, and is much hunted for its skins, and for its oil and flesh. The skins though their covering is hair, not fur, are much valued. The harp seal (*P. grœnlandica*) is abundant on the Arctic coasts of Europe and America, and is killed in great numbers for its oil and skins. There are several other species in the North Atlantic, while some species extend to the tropics. There is a second family of the *Pinnipedia*, known as the *Otariidæ*, or sea lions and sea bears, the former having only long coarse hair, while the latter have in addition a short, soft, and delicate fur, which, under the name of seal skin, is highly valued in commerce. The SEA LION (*q. v.*) is found on both coasts of the Pacific from California and Japan N., and there is an Antarctic species. The celebrated N. species *Callorhinus ursinus*, which yields the valuable sealskin of commerce, is confined to the north Pacific, breeding only on two of the Pribilof Islands, in Bering Sea, and two of the Commander Islands, further W. In 1919 there were 524,264 fur seals; 25,381 were taken. See FUR: BERING SEA: SEA ELEPHANT.

SEALING WAX, a composition for sealing or securely fastening letters or packets. Sealing wax made of resin, and colored with vermilion, lamp-black, white lead, or orpiment, was made in the 16th century.

SEA LION, a popular name for the genus *Otaria*; specifically, *O.* (*Eumetopias*, Gray) *stelleri*, the hair seal of the Pribiloffs, or Steller's sea lion. The male attains a length of 11 or 12 feet, and a



SEA LION

weight of about 1,000 pounds. Color golden rufous, darker behind, limbs approaching black. It is destitute of fur, and its skin therefore is of little value, but the hide, fat, flesh, sinews, and intestines are all useful to the Aleutian islanders. The hides yield excellent leather, oil vessels are made from the stomachs, the sinews are used for threads for binding skin canoes, and the flesh is considered a delicacy. Sea lions are found round Kamchatka and the Asiatic coast to the Kurile islands, and there is a colony of them at San Francisco protected by the National government. In heraldry, a monster consisting of the upper part of a lion combined with the tail of a fish.

SEAMAN, LOUIS LIVINGSTON, an American surgeon, born at Newburgh, N. Y., in 1851. He graduated from Jefferson Medical College, Philadelphia, in 1876, and from the University Medical College, New York, in 1877. He engaged in hospital work in the latter city, and in 1886 made a tour around the world. He served as surgeon of the First Regiment of the United States Volunteer Engineers, in the Spanish-American War, and during the Russo-Japanese War, was with the Japanese Army in Manchuria. At the outbreak of the World War he served in the hospitals of the Belgian Army. He made a special study of the sanitary arrangement of armies, and was considered an authority on that subject. He wrote "The Crucifixion of Belgium"; "Military Preparedness," and many articles on medical and military subjects.

SEAMAN, SIR OWEN, an English writer and editor, born in 1861. He was educated at Shrewsbury School and at Cambridge University. After teaching for about 10 years, he began writing for "Punch" and other periodicals, in 1894. In 1897 he was called to the Inner Temple and in the same year he joined the editorial staff of "Punch," becoming assistant editor in 1902, and editor in 1906. In 1909 he was made honorary fellow of Clair College, Cambridge, and in 1914 he was knighted. He was especially well known for his poetical work in the field of parody. He published "Œdipus, the Wreck" (1888); "Horace at Cambridge" (1894); "Tillers of the Sand" (1895); "The Battle of the Bays" (1896); "In Cap and Bells" (1899); "Borrowed Plumes" (1902); "Harvest of Chaff" (1904); "Salvage" (1908); "War Time" (1915); "Made in England" (1916), etc.

SEAMEN, LAWS RELATING TO. Because of their isolation from the jurisdiction of regular courts for long periods and their absence in foreign countries in the regular course of their employment, it has been found necessary in all countries to pass special legislation regulating the relations of seamen and their employers. England was the first to do this, in 1854, when its Merchant Shipping Act was passed. The provisions of this Act, several times revised, are under the jurisdiction of the British Board of Trade. Various laws for the regulation of the employment of merchant seamen have since been passed in this country, being under the jurisdiction of the Admiralty Court of the Federal Government. The most recent of these was that known as the La Follette Seamen's Act, passed in 1915, which compels every ship to carry a crew of which at least seventy-five per cent must be able to understand orders given in English. As a whole, however, laws for the protection of seamen on American ships have been few in number, and those few have been almost entirely disregarded by shipowners. American ships have been so notorious for the ill treatment of their seamen that until very recently the majority of American seamen have been found on British ships. The "bucko" mate and skipper is still a feature of the American sailing ship. In consequence of this state of affairs the crews of American ships have often been "shanghaied," being inexperienced foreigners who have been abducted by force, usually while under the influence of drugged liquors. The recent development of seamen's labor organizations, rather than legislation, has been the element counteracting these conditions. Under existing laws, however, a seaman may not be discharged in a foreign port without his own consent, unless he has signed a special contract to that effect. On the other hand, he may not leave his employment, unless specified in his contract, and if he does so may be arrested and imprisoned until the departure of the ship, when he is brought forcibly aboard. Flogging is forbidden, but physical violence is, nevertheless, a frequent form of punishment aboard American ships. The laws relating to seamen, in foreign ports, are under the jurisdiction of the American consuls, who act as judges in cases brought before them by shipmasters.

SEA MOUSE, *Aphrodite,* a genus of dorsi-branchiate Annelids or marine worms. The most notable feature in connection with the sea mouse consists in the beautiful iridescent hues exhibited by the hairs or bristles which fringe the sides of the body. The sea mouse inhabits deep water, and may be obtained by dredging. The common species, *A. aculeata* of the British and French coasts, is

six or eight inches long and two or three inches in width.

SEANCE, a sitting; a session, as of some public body; specifically applied by spiritualists to a sitting with the view of evoking spiritual manifestations or of holding communication with spirits.

SEA OF TIBERIAS. See GALILEE, SEA OF.

SEAPLANE. See AERONAUTICS.

SEARCH LIGHT, an electric arc light the rays of which are collected in a parallel beam that may be projected to a great distance and turned in any direction. Search lights are used on naval vessels to show at night the approach of hostile vessels, and to detect floating mines or torpedo boats; also for illuminating signal flags and for signaling by long and short flashes. This system of signaling is used in the army also. Messages may be sent 20 miles or more. Search lights are, broadly speaking, of two kinds: concentrated beams and dispersed beams. The latter were extensively used in the World War to illuminate large areas of water that had been laid with mines. The light is also used in the commercial marine, by liners, etc.

SEARCH, RIGHT OF, in international law, the right of belligerents, during war, to visit and search the vessels of neutrals for contraband of war. Some powerful nations have, at different times, refused to submit to this search; but all the highest authorities upon the law of nations acknowledge the right in time of war as resting on sound principles of public jurisprudence, and upon the institutes and practices of all great maritime powers. The duty of self-preservation gives belligerent nations this right; and as the law now stands, a neutral vessel refusing to be searched would from that proceeding alone be condemned as a lawful prize. The right of search, however, is confined to private merchant vessels, and does not apply to public ships of war. The exercise of this right must also be conducted with due care and regard to the rights and safety of vessels. A neutral is bound not only to submit to search, but to have his vessel duly furnished with the necessary documents to support her neutral character, the want of which is a strong presumptive evidence against the ship's neutrality, and the spoliation of them is still stronger presumption. There may be cases in which the master of a neutral ship may be warranted in defending himself against extreme violence threatened by a cruiser grossly abusing his commission; but, except in extreme cases, no merchant vessel has a right to say for itself, nor any armed vessel for it, that it will not submit to visitation or search, or be carried into a proximate court for judicial inquiry. If, on making the search, the vessel be found employed in contraband trade, or in carrying enemies' property, or troops or dispatches, she is liable to be taken and brought in for adjudication before a prize-court. The above doctrine has been fully admitted in England; but the Government of the United States has energetically refused to submit to the right assumed by the English of searching neutral vessels on the high seas for deserters, and other persons liable to military and naval service. This question, yet not specifically settled, was one of the chief causes of the War of 1812. In 1914, 1915 and 1916, during the World War, American shipping interests contested the right of Great Britain to stop neutral ships and take them into British ports. The controversy was not settled when the United States entered the war.

SEARCH WARRANT, in law, a warrant granted by a justice of the peace to enter the premises of a person suspected of secreting stolen goods, in order to discover and seize the goods if found. Similar warrants are granted to search for property or articles in respect of which other offenses are committed, as base coin, coiners' tools, arms, gunpowder, nitroglycerin, liquors, etc., kept contrary to law.

SEA SERPENT, the name given to gigantic animals, presumedly of serpentine form, which have been frequently described by sailors and others.

Gigantic cuttlefishes, now proved to have a veritable existence, might in many cases imitate an elongated marine form, swimming near the surface of the sea. It is by far the most plausible theory of sea serpent existence to suppose that most of the animals described are really giant cuttlefishes of the Loligo or squid type. The marine snakes or hydrophidæ of the Indian ocean would also serve to personate the "great unknown" if unusually large.

SEA SICKNESS, a nausea, or tendency to vomit, which varies, in respect of duration, in different persons upon their first going to sea. The immediate or exciting cause of sea sickness is variably attributed to the motion of the vessel, or to the effect produced on the eye by moving objects, and by that sense conveyed to the brain.

SEASIDE GRAPE, a small tree of the genus *Coccolobea* (*C. uvifera*), natural order *Polygonaceæ*, which grows on the sea coasts of Florida and the West In-

dies. It has clusters of edible fruit somewhat resembling the currant in appearance, a beautiful hard wood which produces a red dye, and yields the extract known as Jamaica kino.

SEA SLUG, in zoology, any individual of the *Opisthobranchiata*. The name is sometimes confined to the *Nudibranchiates*.

SEA SNAKE, any individual of the family *Hydrophidæ*. They have depressed heads, dilated behind and covered with shields. Their bodies are covered with square plates; their tails are very much compressed and raised vertically, so as to aid them in swimming. They are very venomous. They are found off the coast of India, in the salt water channels of the Sunderbunds, in the seas around the Indian islands, and in the Pacific. They are eaten in Tahiti.

SEA SNIPE, the popular name of a fish, *Centriscus scolopax*.

SEASONS, the alterations in the relative length of day and night, heat and cold, etc., which take place each year. In the United States there are four seasons, spring, summer, autumn, and winter. The Anglo-Saxons reckoned only three, spring, summer, and winter, the words for which are all from Anglo-Saxon; AUTUMN (*q. v.*) was borrowed from the Romans. In India there are but three well-marked seasons of four months each, the hot (February-May), the rainy (June-September), and the cold (October-January). The essential astronomical fact on which the recurrence of the successive seasons depends is that the axis of the earth always points in the same direction, whatever portion of the orbit the earth may at the time be traversing. The inclination of the equator to the ecliptic is 23° 27′. On June 21, when the sun is at the highest point of the ecliptic, the North Pole necessarily inclines toward the sun, and is as much irradiated as it ever can be by his beams, while the South Pole, on the contrary, is as little. It is therefore midsummer in the Northern and midwinter in the Southern Hemisphere. Six months later, Dec. 21, the South Pole points toward the sun. It is therefore now midwinter in the Northern and midsummer in the Southern Hemisphere. At the intermediate periods (March 21 and Sept. 21), the axis of the earth is at right angles to the direction of the sun; hence, in both hemispheres it is the equinox, the vernal at the former date in the Northern and at the latter in the Southern Hemisphere.

SEA SPIDER, or SPIDER CRAB, a marine crab of the genus *Maia* (*M. squinado*). Its body is somewhat triangular in shape, and its legs are slender and generally long. It lives in deep water, and is seldom seen on the shore.

SEA SURGEON, or SURGEON FISH (*Acanthurus chirurgus*), a fish belonging to the teleostean section of Acanthopteri, so named from the presence of a sharp spine on the side and near the extremity of the tail, bearing a resemblance to a surgeon's lancet. It occurs on the Atlantic coasts of South America and Africa, and in the Caribbean seas. Its average length is from 12 to 19 inches.

SEATTLE, the largest city of Washington, and the county-seat of King co. It is a port of entry and is on the E. shore of Puget sound. It is the terminus of 8 transcontinental railways, four of which, the Great Northern, the Northern Pacific, the Chicago, Milwaukee and St. Paul, and the Union Pacific-Oregon-Washington railroads, enter the city on their own tracks. The Canadian Pacific and Grand Trunk make connections by water. The Canadian Pacific also has connection by rail. There were in 1919 within the city limits, 269 miles of street railway. There is steamship connection with all parts of the world by trans-Pacific lines and by the Panama canal.

The city is located between the Cascade and Olympic mountain ranges, with Puget sound on the W. and Lake Washington on the E. The business and manufacturing sections of the city occupy levels nearer the sea, while the residential districts are on the hills. In recent years regrading operations of great magnitude have resulted in reducing the elevation of many of the streets. Within the limits of the city are two large lakes, one of which is faced by a public park. The climate is healthful, with a temperature ranging from 96 to 11°. Severe cold is practically unknown. The precipitation averages 33.9 inches per year. Seattle is the ocean gateway through which lumber, wheat, fruit, copper, lead, and other raw products of the N. W. part of the United States make their way to tidewater and thence by ships to the Atlantic, to Europe and to world markets. Elliott bay, the main harbor, is a broad sheltered indentation in the E. shore of Puget sound. The mouth of the bay is more than 6 miles across. Between this outer harbor and the main water front stretch approximately 5 miles of deep water which is nearly 3 miles across at its narrowest point. The water front is well supplied with piers. One completed in 1920 has a capacity for berthing eleven 9,000-ton ocean ships at one time. It is 310 feet wide and half a mile long. The ship canal provides facilities for ships

780 feet in length. The outer and inner harbors together have a total frontage of 194 miles. The cargo handling facilities represent an investment of over $20,000,000, of which $7,000,000 have been spent by the municipal port of Seattle. Out of the city operate ship services to Alaska, Yokohama, Shanghai, Hongkong, Manchuria, Batavia, Calcutta and other Oriental ports.

The park and boulevard system of the city comprises nearly 200 acres. There are over 20 improved playgrounds and about 25 miles of scenic boulevards, an observation pier, and a bathing pavilion. The most important parks are Woodland, Ravenna, Kinniar, Madrona, Volunteer, Washington, and Jefferson. The University of Washington covers, with its campus, 355 acres within the city limits. The notable buildings include the Cathedral of St. James, Providence Hospital, Federal building, Y. W. C. A. building, Rainier Club, and a public library. There are many business building, clubs and theaters. The city has excellent educational facilities including libraries and musical and art institutions. The public library has 9 branches and circulates more than 1,500,000 volumes annually. Practically every religious denomination is represented by churches. It is the seat of the Catholic diocese of Washington.

Seattle has developed greatly in recent years as a commercial city. The total imports for the fiscal year 1920 amounted to $173,527,650, and the exports to $228,186,694. A large commerce is carried on with China and Japan and it has trade relations with practically every country in Europe, Asia and Africa, as well as Australia. Practically all the trade with Alaska is carried on through Seattle.

It is the center of a great agricultural and stock raising area which includes practically the States of Washington, Oregon, Idaho, Montana and Wyoming. It is also the principal headquarters of the great lumbering industry of Washington. Its business in fish exceeds $73,000,000 per annum.

The industrial importance of the city has greatly increased in recent years. This has especially followed the opening of the Panama canal. During the World War it was an important shipbuilding center and nearly 20% of all the merchant ships secured by the government during the first 12 months of the war were launched in the yards of the city. In 1920 there were over 40,000 workers in shipyards, metal working plants, and in the 1,300 industrial establishments. The annual payroll amounts to over $200,000,000. Lumber and flour manufacturing rank after shipbuilding in importance. Industries connected with the steel and iron industry made great headway in the five years dating from 1915. Among other important industries are rolling mills, car shops, meat packing plants, manufactures of logging and mining machinery, wireless apparatus, wood pipe, gas engines, airplanes, stoves, shoes, cans, bags and rope. Power is furnished by hydro-electric plants, and it has been developed on a low basis of cost.

There were in 1919 seven National and many private banks. The saving deposits amounted to $61,416,305. The bank clearings in that year were $2,021,004,351.

In 1909 the Alaska-Yukon-Pacific Exposition was held in Seattle. It was attended by nearly 8,000,000 persons. Pop. (1900) 80,671; (1910) 237,194; (1920) 315,312.

SEA UNICORN, a popular name given to the narwhal.

SEA URCHIN, one of the *Echinoids*, or *Echinidæ*, an order of *Echinodermata*. They have the body covered with a calcareous crust or shell, of an extremely porous structure, in polygonal plates nicely adapted to each other, and increasing by additions to the edges of each plate, so that the shell may enlarge with the enlargement of the animal, while new plates are also added around the superior orifice. The shell is pierced with rows of holes for the ambulacra, and is externally covered in a living state with a membrane, sometimes very delicate, sometimes thick and spongy, and unites the bases of all the spines. The spines differ very much in the different genera and species. They are attached to tubercles on the surface of the shell by cup-like bases capable of working upon the tubercles in the manner of a ball-and-socket joint; and they are moved by means of the connecting membrane so as to be employed in locomotion. By means of the spines, some can walk even on dry ground; others employ them in burying themselves in the sand. The mouth of the *Echinidæ* is situated at the lower orifice of the shell, and is generally furnished with five flat calcareous teeth moved by a very complex apparatus of bony sockets and muscles. Their food is supposed to consist of small crustaceans and mollusks. They abound in all seas.

SEA-WATER THERAPY, or THALASSOTHERAPY. Sea water is used in the treatment of diseased or unhealthy conditions by two different methods, firstly by external bathing, secondly by injections into the tissues. The first is, of course, by far the most common. The tonic effects of sea-bathing, even upon the healthy, have long been recognized, but it has been found especially beneficial

in the treatment of certain morbid conditions. In some nervous disorders, and in the treatment of muscular rheumatism, arthritis and scrofula, considerable success has been experienced. Those suffering from profuse perspiration may also derive benefit from it, and it seems to increase the resistance of those unduly subject to colds. It is advisable, however, to exercise caution as regards the extent of indulgence in sea-bathing. In certain diseased conditions it should be avoided altogether. Those, for instance, suffering from heart disease or disease of the blood vessels, from organic affections of the nervous system, from epilepsy and from some other diseases, should not bathe in cold sea-water except under medical advice. Those whose constitutions are not strong and in whom violent shivering follows immersion in cold water should not remain in the water for more than two to five minutes, and hot drinks should be taken to bring about a quick reaction. In some cases, where bathing in the open is inadvisable, beneficial effects can be produced by taking warm sea-water baths in the house. Those living at considerable distances from the seashore can obtain the desired results by dissolving the necessary quantity of sea-salts in fresh water.

Injections of sea-water into the tissues is looked upon with disfavor by American physicians, but in France much has been claimed for this method of application. The water is taken far out to sea and sterilized. Injections are made into the loose abdominal tissues or into the buttocks. It is claimed that good effects are produced in infantile diarrhœa.

SEAWEED, a plant growing wholly in water, fresh or salt. Some are so small and delicate that they can be seen only with a microscope, and others are of such immense growths that they almost fill up the seas in which they live. The great seaweeds called sea aprons are often several hundred feet long. Seaweeds are not much like the plants that grow on land. They have no roots and therefore do not get any of their food from the earth, but live entirely from the water. Many float around in the water and many are fastened to rocks at the bottom of the sea, to which they are made fast by a kind of stem with a sticky surface. They have no real leaves, but have parts which answer for leaves. Sometimes these are like wavy thongs, sometimes like crumpled threads; others are like fans, balloons, belts, delicate ribbons, or shreds of jelly. Some are thick and tough, others thin and tender; and they are of many colors. Those in deep water are mostly brown, of different shades, and those nearer the surface and often floating are mostly green; the pinks and reds are found chiefly in shallow water near the shore.

In the bottom of the ocean the seaweeds form great groves and woods which lace their branches together and make grottoes and galleries. Many are larger than any trees on land, and as they are many-colored they are probably far more beautiful than our forests. The seaweeds that float often form islands which drift about in the currents. Not far from the Azores is an immense bank of seaweed called the Sargasso Sea from the kind of weed (sargassum) of which it is made up.

Many of the seaweeds are very useful to man. In eastern Europe they are dried for fuel and put on land for manure. The seaweed called bladder wrack and knobbed rack were once much used for making kelp. In northern Europe these are fed to pigs, and when food is scarce even horses and cattle thrive on them. In Holland a kind of seaweed is used in building dykes or banks to keep the sea from flowing on to the land, and the same kind is also used for stuffing mattresses and cushions and for packing goods. The Sandwich Islanders, the Chinese and Japanese, the Icelanders, and many other people eat various kinds of seaweeds. The edible birds' nests of the Chinese are said to be built by swallows out of a kind of seaweed which has much gelatine in it. Another kind in China contains so much gelatine that it is largely used for making glue and varnish. Among the most useful of the seaweeds is that commonly called Irish moss or carrageen, which takes the place of isinglass in making blancmange and jellies, and is used also in making sizing and lager beer. Dulse, a purple seaweed, called dillesk by the Irish, is also collected and used for food.

Seaweeds belong to the lowest class of flowerless plants. They do not have seeds, but grow from spores, as do lichens.

The word seaweed is made up of the Anglo-Saxon *sæ*, the sea, and *weod*, weed.

SEAWELL, MOLLY ELLIOT, an American author; born in Gloucester co., Va., Oct. 23, 1860. She published: "The Sprightly Romance of Marsac"; "Hale Weston"; "Twelve Naval Captains" (1897); "A Virginia Cavalier" (1896); "The House of Egremont" (1901); "The Jugglers," "Fifi," "The Lady's Battle," "Franceska," "The Diary of a Beauty," etc. She died in 1916.

SEA WOLF, a fish, *Anarrhicas lupus*, about seven or eight feet in length; gray or brown, with transverse black or brown stripes. Its formidable aspect and sharp

effective teeth constitute its chief resemblance to a wolf.

SEBACEOUS GLANDS, glands having small ducts which open within the mouth of hair follicles and supply them with sebaceous matter. The largest are on the sides of the nose.

SEBACIC ACID, in chemistry, $C_8H_{16} \begin{matrix} COHO \\ COHO \end{matrix}$, pyroleic acid or sebic acid; an acid of the oxalic series, obtained from fats containinig oleic acid by dry distillation or action of nitric acid, and from castor oil by heating with potash. It crystallizes in white very light needles, has an acid taste, melts at 127°, and dissolves easily in hot water, alcohol, and ether. It forms acid and neutral salts, which are mostly soluble in water, and crystallizable.

SEBAGO LAKE, a lake in Cumberland co., Me.; about 18 miles N. W. of Portland, with which it is connected by the Cumberland and Oxford canal; outlet in Casco bay; length, 12 miles; width, 8 miles.

SEBASTES, in ichthyology, a genus of *Scorpænoidæ*, with about 20 species, widely distributed in temperate seas. In general appearance they resemble the Sea Perches, and are esteemed as food.

SEBASTIAN, DOM, King of Portugal; born in Lisbon in 1554; ascended the throne at three years of age, on the death of his grandfather, John III. Possessed of a romantic and venturesome disposition, he determined to carry on war against the Moors in Africa, hoping thereby to effect something for Christianity and the fame of Portugal. He accordingly equipped a fleet and an army, which comprised the flower of the Portuguese nobility, and sailed for Africa in 1578, at the age of 23 years. A general engagement soon took place at Alcacer-el-Xebir, and the ardor of the young king bore him into the midst of the enemy. Though Sebastian fought with the most determined bravery, so complete was the slaughter that not more than 50 Portuguese are said to have survived. Sebastian disappeared. The mystery surrounding his fate led several adventurers to assume his person, but there seems to be no doubt that he died on the field of battle. His death is supposed to have occurred August 4, 1578.

SEBASTOPOL or **SEVASTOPOL**, a fortified town and seaport of European Russia, on the W. coast of the Crimea. It stands on a creek on the S. side of one of the finest bays in the world, the Etenus of Strabo, which is defended by strong forts on both sides. In 1853 Russia demanded from the Turkish Government guarantees for the rights of the Greek Christians of Turkey, which the Porte believed to involve an actual abdication of its sovereign rights, and which it therefore refused to concede. This led, in the same year, to the beginning of the Eastern or Crimean War, in which France, England and Sardinia took sides with Turkey, on the ground that the existence of the latter empire, and the equilibrium of political power in Europe, were endangered by Russia. The armies of the allies effected a landing at the Bay of Eupatoria, Sept. 14, 1854. On their southern march toward Sebastopol they encountered the Russian forces, commanded by Prince Menzikoff, on the banks of the Alma. A bloody battle was fought (Sept. 20), in which the Russians were compelled to retreat. On Sept. 25 the British forces seized Balaklava, and on Oct. 9 the regular siege of the southern portion of Sebastopol commenced, the Russians having sunk vessels in the entrance to the harbor and thus rendered the city unassailable by maritime force. On Oct. 25 and Nov. 5, the Russians vainly attempted to annihilate the besieging forces in the battles of Balaklava and Inkermann, but afterward confined themselves mainly to the defensive, though making frequent sorties. Among these conflicts some assumed almost the character of regular field battles; for instance, an unsuccessful attack of the French on a new redoubt (Feb. 23, 1855), their first assault on the Malakoff and Redan (June 18), and the battle of the Tchernaya (Aug. 16), in which the Russians, numbering 50,000 infantry and 6,000 cavalry, made a last effort to break the aggressive force of the enemy. The trenches having been driven so near the Russian defensive works that another assault could not be ventured, the final bombardment was opened Sept. 5, and lasted for three days. On Sept. 8 the Malakoff and Redan were stormed and taken by the allies after a desperate struggle. The Russians, after having blown up their extensive fortifications on the S. shore of the harbor, retreated to the N. side, which the allies never seriously attempted to conquer. The latter, having destroyed the costly docks, arsenals, and shipyards of Sebastopol, remained inactive in their camps, and, with the exception of the capture and sack of Kertch, on the Strait of Yenikale, no further feats of arms were accomplished. The forces of the allies were withdrawn in the summer and autumn of 1856. Though the allies did not obtain any decided success, Russia suffered immense loss of military prestige, and any further aggression on her part in S. Europe was for a time prevented. By the peace of

Paris (1856) Russia lost the right of navigation on the Danube, besides a strip of territory to the N. of that river, and, also, the unrestricted navigation of the Black sea. In November, 1870, Russia, availing herself of the Franco-Prussian imbroglio, demanded and obtained from the Western Powers a revision of the treaty of Paris, in so far as it affected the restrictions placed on her in the Black sea. The Bolshevist army in November, 1920, occupied Sebastopol after defeating the anti-Red forces under General Wrangel. Pop. about 77,000.

SECANT, in geometry, a straight line cutting a curve in two or more points. If a secant line be revolved about one of its points of secancy till the other point of secancy coincides with it, the secant becomes a tangent. If it be still further revolved, it again becomes a secant on the other side; hence, a tangent to a curve, at any point, is a limit of all secants through that point. A secant plane is one which intersects a surface or solid. In trigonometry, a straight line drawn from the center of a circle through the second extremity of an arc, and terminating in a tangent to the first extremity of the arc.

SECAUCUS, a borough of New Jersey, in Hudson co. It is on the Delaware, Lackawanna, and Western railroad. It is the center of an important farming and stock-raising region. Its notable buildings include a public library, borough hall, and the county institutions. Pop. (1910) 4,740; (1920) 5,423.

SECESSION. Whenever a State has claimed the right to withdraw from the Union, it has based its claim on the doctrine of State sovereignty. This claim must be considered as emphatically distinct from the right of revolution, insurrection, or violent revolts, in all of which there is no claim of legal right, and the appeal of which is to force instead of to reason. In its turn, nearly every State in the Union has advanced the right of secession, and usually each has been condemned by the others as treasonable. This claim was specifically brought forward or involved in the Kentucky "Resolutions," the Hartford "Convention," and the "Nullification Ordinance." In the discussion preceding the annexation of Texas there were arguments that led to threats of secession in the South if the refusal to annex should be passed, and in the North if permission to annex should be granted. This demonstrates that before these cases materialized, the doctrine of State sovereignty had been understood, both in the North and South. Among the Southern States there had been some talk of co-operation for the purpose of effecting a secession programme, for no State would have made the attempt independently, but such discussion had resulted in nothing. Nevertheless, State sovereignty and slavery had been bound up together since about 1835, and the logical consequence was secession. Though no such issue had actually been instituted, the feeling between non-slave-holding sections and slave-holding sections, and between the North and South, had become more and more strained. The election of Abraham Lincoln, when the political situation was flanked with sectional differences resting on State claims, was all that was necessary to change the theory of secession in the South into an attempt to effect the reality. South Carolina took the lead by issuing a circular to all the Southern States, in which she declared her readiness to unite with any other States in the act of secession, or to secede alone, provided any other State would agree to follow. No single State was prepared or willing to secede alone, but Florida, Mississippi and Alabama agreed to secede with any other State. Again South Carolina was leader in calling a State convention, and on Dec. 20, 1860, the Act of 1788, ratifying the National Constitution, was repealed, and it was declared "that the union now subsisting between South Carolina and other States, under the name of the United States of America, is hereby dissolved." A declaration of the causes for this act was formulated, and on the 24th was adopted. The governor proclaimed "the secession of South Carolina" the same day. Mississippi was the first to follow this example, Jan. 9, 1861, then in succession came Florida, Jan. 10; Alabama, Jan. 11; Georgia, Jan. 19; Louisiana, Jan. 26; and Texas, Feb. 1, though in the case of this last State the proceedings were decidedly irregular. Virginia followed in April; Arkansas and North Carolina in May; and Tennessee in June. The Civil War was the consequence.

The final issue was the victory of the government, the surrender of the Confederate to the Federal army, and the full union of the United States of America. See CONFEDERATE STATES.

SECKER, THOMAS, Archbishop of Canterbury; born in Sibthorpe, Nottinghamshire, in 1693; son of a Dissenter of independent means, who wished him to enter the ministry of his own communion. In 1716, however, the son turned to medicine, taking his doctorate in physic at Leyden in 1721. Meanwhile, urged by his old schoolfellow, Joseph Butler, he had decided to take Anglican orders; in 1722

he graduated B.A. at Oxford, and in that and the following year he was ordained deacon and priest. His preferments were Houghton-le-Spring (1724), Ryton and a prebend at Durham (1727), chaplain to the king (1732), St. James's, London (1733), Bishop of Bristol (1735), of Oxford (1737), Dean of St. Paul's, for which he resigned the living of St. James's (1750), and the primacy (1758). He died Aug. 3, 1768.

SECOND, the 60th part of a minute of time or of a minute of a degree. In music, the interval of a second is the difference between any sound and the next nearest sound above or below it. There are three kinds—the minor second or semitone, the major second, and the extreme sharp second. Also a lower part added to a melody when arranged for two voices or instruments.

SECOND ADVENTISTS, a religious organization having six slightly differing branches in the United States. They are Protestants and their belief is characterized by faith that at some time in the future there will be a visible reappearance of Christ. They do not agree among themselves whether this "divine return" will be visible to all the Church, or to the whole world, or to certain elect "first-fruits" of the Church. The original Adventists were called Millerites, and were followers of William Miller (1782-1849). Miller promulgated a belief that the world would end and that the millennium would begin in October, 1843. Many people had such implicit faith in his prophecy that they did not "plant or reap" crops, neglected their business, and spent months of time before the appointed hour in religious exercises so as to be in readiness to ascend to heaven. When Miller's prediction proved a failure, some of his followers lost faith in the doctrine, while others decided that an error in calculation had been made. Other predictions have been made since that time. Disappointment, however, has not materially lessened the number of Adventists, since from 50,000 in 1843 they increased to 60,000 in 1890, and in 1900 attained a following of over 125,000. In 1919 there were 4,181 churches with a membership of 162,667, and 5,610 Sunday schools with 171,914 members. All sects of Adventists are congregational in church government. They are very orthodox and strict to an extreme in their mode of living. Many kinds of amusements are prohibited. The denominations are: Evangelical Adventists, Seventh Day Adventists, Church of God, Life and Advent Union, Age to Come Adventists, and the Advent-Christians.

SECONDARY SCHOOLS, educational institutions in the United States higher in grade than the COMMON SCHOOLS (*q. v.*) and next below the grade of colleges. Under this head are classed all public high schools, academies, etc. Under special secondary schools are included all preparatory, normal and manual training schools. The increase and development of public secondary schools has been very rapid. In 1918 there were 678,469 pupils enrolled in the high schools of the United States.

SECOND SIGHT, a gift of prophetic vision, long supposed in the Scotch Highlands and elsewhere to belong to particular persons. The most common form it took was to see the wraith, fetch, or shadowy second self of some person soon to die, often wrapped in a shroud, or attended with some other of the special circumstances of death or burial.

SECRETARY BIRD, the *Serpentarius secretarius*, from South Africa, a bird protected by the native and English authorities for the service it renders in destroying venomous serpents, which it kills

SECRETARY BIRD

by blows from its powerful feet and bill. The secretary bird stands about four feet high; upper surface grayish-blue, shaded with reddish-brown on wing coverts; throat white, thighs black, tail feathers very long, black at base paling into gray, tipped with white; two long central feathers bluish-gray tipped with black and white. Crest of 10 feathers black or gray tipped with black. From the fancied re-

semblance of this crest to a pen behind a clerk's ear, the bird derived its specific Latin and popular English name.

SECRETION, in physiology, the process by which materials are separated from the blood, and from the organs in which they are formed, for the purpose either of serving some ulterior office in the animal economy, or being discharged from the body as excrement. Secretion is one of the natural functions of the living body, and is as necessary to health as nutrition. Where the secreted materials have some ulterior purpose to serve, they are known as secretions; where they are discharged from the body, excretions. Most of the secretions seem to consist of substances not pre-existing in the same form in the blood, but requiring special organs and process of elaboration for their formation. Excretions, on the other hand, commonly or chiefly consist of substances existing ready formed in the blood, and are merely extracted therefrom. In general, however, the structure of the parts engaged in eliminating excretions is as complex as that of the parts concerned in the formation of secretions. The secretions may be arranged into three sorts: (1) exhalations; (2) follicular secretion; and (3) glandular secretion. The exhalations take place as well within the body as at the skin or in the mucous membranes, and are thus divided into external and internal. The follicles are divided into mucous and cutaneous, and into simple and compound. In almost all the points of the skin little openings exist which are the orifices of small hollow organs with membranous sides, generally filled with an albuminous and fatty matter. The small organs are called the follicles of the skin. The glands, however, are the principal organs to which the office of secreting is more especially ascribed, and the number of them is considerable. The glandular secretions are of seven different sorts, namely, tears, saliva, bile, pancreatic fluid, urine, semen, and milk.

In botany, in consequence of the action of air and light on the watery contents of the green leaves of plants, the materials within them are subjected to a very active chemical condition, by which various substances are formed,—as protein matters, gum, sugar, starch, etc., all of which are essentially necessary to the growth of the plant. Besides these are other matters, such as coloring substances, numerous acids, various alkaloids, etc., which, after their production, perform no further active part in the plant, and are hence removed from the young and vitally active parts to be stored up in the older tissues of the plants as secretions, or removed altogether from them as excretions.

SECRET SERVICE, UNITED STATES, a bureau connected with the Treasury Department, whose chief and almost sole object is to guard against the counterfeiting of the money of the United States and the detection and punishment of the counterfeiters. It is presided over by a chief, who has under him a number of skilful detectives, who are stationed in various parts of the country or assigned to special fields of operation on occasions of emergency.

SECRET SOCIETIES, organizations that in some form or other have existed in all ages of the world's history. In the ancient world many of the more influential religions had their mysteries, the ceremonies connected with which were generally performed in secret and only in the presence of those who had been duly initiated. These inner and more secret groups of priests and initiated worshipers existed in association with the worship of Mithras in Persia, of Orpheus and Dionysus in Greece, at Eleusis and elsewhere, or Osiris and Serapis in Egypt, and of the Great Mother (Cybele) in Phrygia. The followers of Pythagoras formed what was in many respects a secret religious society, though philosophy and political doctrine took a foremost place in their teachings. Among the Jews there proceeded from out of the Pharisees the puritanical Essenes (Chasidim), forerunners of the Jewish Cabalists, who professed a secret system of theology and philosophy associated with mystic practices, and of Christian Gnostics, and formed exclusive sects based on initiation and esoteric teaching. The lineal successors of these last were the various mediæval sects of Cathari, most of whom invested their teaching and their worship with many features of mystery. In the Roman Catholic Church the office of the Inquisition deserves to be called a secret society, and so does the order of the Jesuits; though in both cases the secrecy was due to political rather than to strictly religious causes. The Knights Templar toward the close of their history as a distinct order seem in several cases to have lapsed into the practice of secret rites and belief in certain secret doctrines.

The Freemasons and the Odd Fellows are perhaps the best known of the secret societies in the United States that have cultivated social aims. The Rosicrucians had their origin in the 17th century, and directed their attention to the discovery of such things as the philosopher's stone and the elixir of life, to the exorcism of spirits, and such like pursuits. Specu-

lative Freemasonry does not go further back than the 18th century; its objects are philanthropic and moral. There are associations similar in character to it in Tahiti and others of the Pacific islands, and among the Foulah and the Negroes of Sierra Leone and the adjacent parts of Africa. The celebrated "Vehmgerichte" or secret courts of Westphalia arose in a time of great public confusion, and made it their business to maintain that order and respect for the law which it should have been the concern of the emperor and his associates to have secured and preserved. There existed in Sicily from the 12th to the 18th century an organization (the Beati Paoli) very similar to the "Vehmgerichte." On the other hand, there have been numerous associations of a secret kind formed for criminal purposes, and for mutual assistance against and in defiance of the laws of the land; the Assassins in Persia and Syria, the Thugs in India, the Camorra, the Mafia, and the Decisi (1815) in Italy, the Chauffeurs in France (who arose during the religious wars and were not suppressed till the Revolution), and the Garduna in Spain (formed after the wars against the Moors; suppressed in 1822) may be instanced.

The Illuminati, the authors of a movement that grew up in Germany in the end of the 18th century, united political and religious ends, and may be said, summarily, to have aimed at realizing the ideals of the French Revolution. The following century was wonderfully prolific in political secret societies. Italy was literally honeycombed with them during the years she was struggling for her independence; the best known was that of the Carbonari. At the same time there were similar societies in other countries of Europe, as the Burschenschaft and Landsmannschaft societies in Germany, the Associated Patriots in France, the Communeros in Spain, the Hetairia in Greece, the Society of United Slavonians and the Decabrists in Russia, the Polish Templars, and the associations known as Young Germany, Young Italy, Young Poland, Young Switzerland. Nearly all the political revolutions that took place in France during the course of the 19th century were greatly fomented by secret societies, especially the revolution of 1848. The most momentous movements of a socio-political tendency that have sprung up on the Continent, and spread to some extent to England, are those of the Nihilists, the Anarchists, and various sects of extreme Socialists. The murder of the Archduke Ferdinand which precipitated the World War was claimed by the Austrian Government to have been plotted by a Serbian secret society.

There are perhaps no people in the world who favor secret societies more than the Chinese and the inhabitants of the United States. The most powerful organization of this nature in China is the Tien-ti Hwuy (Union of Heaven and Earth), which presents many features analogous to Freemasonry. Its principal object was the overthrow of the Manchu dynasty and the restoration of the last Chinese dynasty of the Myng. But about the real purposes of this, as of most other secret societies that exist among the Chinese, our information is exceedingly scanty. The Society of the Elder Brethren, which is, generally speaking, a combination of the most lawless elements of the population in the central provinces (Honan to Hunan), proclaims a fanatical hatred to all foreigners, including the Manchus. Secret societies of all kinds, and for nearly all conceivable purposes, are found in the United States.

SECTOR, in geometry, that portion of the area of a circle included between two radii and an arc. The area of a sector is equal to the product of the arc of the sector by half of the radius. If the angle at the center is given, the length of the arc of the sector may be found, since it is equal to x multiplied by the radius into the ratio of 180° to the number of degrees of the sector. A spherical sector or the sector of a sphere is a volume or solid that may be generated by revolving a sector of a circle about a straight line drawn through the vertex of the sector as an axis, or it is the conic solid whose vertex coincides with the center of the sphere, and whose base is a segment of the same sphere. In mathematics and surveying, a mathematical instrument used for laying down plans, measuring angles, etc. It has two legs, united by a rule-joint, and graduated. The scales put on sectors are divided into single and double; the former has a line with inches divided into eighths or tenths; a second, into decimals containing 100 parts; a third, into chords; the fourth has sines; the fifth, tangents; the sixth, rhombs; the seventh and eighth have latitudes, hours, etc. The double scale contains a line of lines; second, a line of chords; third, a line of sines; fourth, tangents to 45°; fifth, secants; sixth, tangents above 45°; seventh, polygons. In surveying, the instrument is mounted on a leg or tripod, and the bob depending from the axis of the rule-joint indicates the station exactly.

SECULAR, occurring or observed once in an age, century, or cycle; as a secular year. Also pertaining or relating to an age, generation, or period of time; as secular inequality. Or pertaining or hav-

ing reference to this present world, or to things not spiritual or holy; relating to things not primarily or immediately affecting the soul; worldly; temporal; as, secular power, secular affairs. In the Roman Catholic Church, not regular, not bound by monastic vows or rules; not confined to a religious house or subject to the rules of a clerical community; as, a secular priest; an ecclesiastic not bound by monastic rules; hence a layman.

SECULAR GAMES, a great festival, probably of Etruscan origin, anciently celebrated at Rome to mark the commencement of a new *sæculum* or generation. In 249 B. C. it was decreed that the secular games should be celebrated every hundredth year after that date; but this decree was frequently disregarded, and they were celebrated at very irregular intervals.

SECULARISM, the name given, about 1846, by George J. Holyoake to an ethical system founded on natural morality.

SEDALIA, a city and county-seat of Pettis co., Mo.; on the Missouri Pacific, and the Missouri, Kansas, and Texas railroads; 95 miles E. of Kansas City. Here are the Convent of St. Joseph, United States government building, hospital, Convention Hall, street railroad and electric light plants, National and State banks, and daily, weekly, and monthly periodicals. The city has besides large locomotive and car shops, flouring mills, grain elevators, iron foundries, manufactories of farming implements, etc. During most of the Civil War the city was a United States military post. Pop. (1910) 17,822; (1920) 21,144.

SEDAN, a fortified town of France, department of Ardennes, on the Meuse, 10 miles E. S. E. of Mezières. Sedan has been long celebrated for its woolen manufactures, consisting principally of fine black cloths and cassimeres. Here, Sept. 1–2, 1870, a battle was fought between the French, under Napoleon III., and the Prussians, under King William and the crown prince, in which the former being defeated, the emperor, while still at the head of an army of more than 100,000 men, surrendered himself and his troops, along with the strong and well-appointed fortress of Sedan to the Prussians. In the World War the Germans occupied Sedan until the closing days of the Meuse-Argonne offensive, when it was occupied by French troops. Pop. about 22,000.

SEDAN CHAIR, a portable covered vehicle for carrying a single person, borne on two poles by two men. The name is derived from the town of Sedan, where this species of conveyance is said to have been invented. The Duke of Buckingham used one in the reign of James I., a proceeding which gave general offense, it being made matter of public remark that this loyal favorite used his fellow-countryman to do the work of beasts. In September, 1634, Sir Francis Duncombe got a letter patent, granting him the sole right and privilege for 14 years to use and let for hire within London and Westminster "covered chairs" to prevent the unnecessary use of coaches; according to Evelyn he got the notion from Naples. Sedan chairs were largely used during the greater part of the 18th century, being found very well adapted for transporting persons in full dress to public and private entertainments.

SEDATIVE, in medicine a remedy which allays irritability and irritation, and which assuages pain. Sedatives are divided according to the parts on which they act into external or local.

SEDDON, RICHARD JOHN, a New Zealand public official, born at Eccleston, England, in 1845. He went to Australia as a mechanical engineer in 1863, and thereafter removed to New Zealand, where he took an active part in politics. He entered the colonial parliament in 1879, and was Minister of Mines from 1891 to 1893. In the latter year he was appointed Premier. He retained that office until his death, in 1906. He was a strong advocate of the policy of state socialism.

SEDGE (*Carex;* natural order, *Cyperaceæ*), an extensive genus of grass-like plants containing thousands of species, mostly inhabiting the N. and temperate parts of the globe. The greater portion of the species are marsh plants. They furnish coarse fodder, which is rejected by most of the domestic quadrupeds.

SEDGEMOOR, a marshy tract in Somersetshire, England, about 5 miles S. E. of Bridgewater. In 1685 it was the scene of the battle in which the Duke of Monmouth was defeated by the troops of James II.

SEDGE WARBLER, the *Acrocephalus schænobænus*, a small European singing bird. Its total length is rather less than five inches; tail comparatively short; upper surface rufous-brown, clouded with a darker shade; breast, belly, and lower tail coverts pale buff. The eggs are five or six in number, pale yellowish-brown.

SEDGWICK, ADAM, an English geologist; born in Dent, Yorkshire, England, in 1785. He was educated at Sedberg and at Cambridge University and in

1818 was appointed Woodwardian Professor of Geology in the latter; this chair he held till within a short time of his death. His chief services to geology consisted in the determination of the geological relations of the palæozoic strata of Devon and Cornwall, and of those strata afterward called Permian in the N. E. and N. W. of England, in the explanation of the geological character of north Wales, and not less in the enlargement of the geological museum at Cambridge. The only considerable work of Professor Sedgwick's is a "Discourse on the Studies of the University of Cambridge," which had a wide circulation. He died in Trinity College, Cambridge, Jan. 27, 1873.

SEDGWICK, ANNE DOUGLAS (Mrs. Basil de Selincourt), an American novelist, born in Englewood, N. J., in 1873. While still a child, she was taken abroad by her parents, where she remained for the greater part of her life. For several years she was a student of painting, and her pictures were shown at several exhibitions. Her novels include "The Dull Miss Archinard" (1898); "The Rescue" (1902); "Franklin Winslow Kane" (1910); "Tante" (1911); "The Encounter" (1914). She contributed many short stories to magazines.

SEDGWICK, ELLERY, an American Editor, born in New York in 1872. He graduated from Harvard in 1894, and for a time taught at Groton School. From 1896 to 1900 he was assistant editor of "The Youth's Companion," and subsequently became editor of "Leslie's Magazine," and the "American Magazine." He purchased and became the editor of the "Atlantic Monthly." He was a member of the American Academy of Arts and Letters, and of several historical societies.

SEDGWICK, HENRY DWIGHT, an American author, born at Stockbridge, Mass., in 1861. He studied law and was admitted to the bar in 1884 and until 1898 practiced in New York. He wrote "Life of Father Hecker" (1897); "Life of Samuel Champlain" (1901); "Essays on Great Writers" (1902); "Life of Francis Parkman" (1904); "Italy in the Thirteenth Century" (1912); "Dante" (1919). He was a member of the National Institute of Arts and Letters.

SEDITION, a factious rising or commotion in a state, not amounting to insurrection; the stirring up or fomenting of such a commotion; the stirring up or fomenting of discontent against government, and disturbance of public tranquillity, as, by inflammatory speeches or writings; acts or language inciting to a breach of the public peace; excitement of resistance to lawful authority. Sedition comprises such offenses of this class as do not amount to treason, being without the overt acts which are essential to the latter.

SEDLEY, SIR CHARLES, an English dramatist; born in Aylesford, Kent, England, in 1639. He is author of the favorite song "Phyllis." He wrote four comedies, among them "The Mulberry Garden" (1686) and two tragedies. He died Aug. 20, 1701.

SEE, a diocese; the seat of episcopal authority; the jurisdiction; as, an episcopal see; the province or jurisdiction of an archbishop; as, an archiepiscopal see; the seat place, or office of the Pope or Roman pontiff; as, the Papal See; the authority of the Pope or court of Rome; as, he was delegated by the See of Rome.

SEE, THOMAS JEFFERSON JACKSON, an American astronomer; born near Montgomery City, Mo., Feb. 19, 1866; was graduated at the University of Missouri in 1889, and at the University of Berlin in 1892; was in charge of the observatory of the University of Missouri in 1887–1889; had charge of and aided in the organization of the Yerkes Observatory of the University of Chicago in 1893–1896; was astronomer of the Lowell Observatory during the survey of the Southern heavens in 1896–1898; became Professor of Mathematics in the United States Naval Academy in 1899; and in December of that year took charge of the 26-inch equatorial telescope of the United States Naval Observatory, Naval Academy 1899-1902. From 1903 he was in charge of the Naval Observatory, Mare Island, Cal. He completed about 45 orbits of double stars; was a Fellow of the Royal Astronomical Society; member of the American Philosophical Society; the American Mathematical Society, the Astronomische Gesellschaft, etc.; and was the author of numerous astronomical papers and books, including "Researches on the Evolution of the Stellar Systems," and "The Evolution of the Double-star Systems."

SEED, consists essentially of the young plant or embryo, inclosed in integuments, of which there are usually two. It varies much in form. The outer integument, or seed coat, is termed the testa or episperm. It is usually of a brown or somewhat similar hue, but it frequently assumes other colors. The inner integument is called the tegmen, or endospleura; it is generally of a soft and delicate nature. A third integument, more or less complete, is occasionally found on the surface of the others. The inner portion of the seed, called the nucleus, or kernel, may either consist of the embryo

alone, as in the wallflower and the bean, or of the embryo inclosed in albumen or perisperm, as in the morning-glory. When the nourishing matter, called albumen, is present, the seed is said to be albuminous; when it is absent, to be exalbuminous. The duration of the vitality of seeds is a much discussed question. Few seeds germinate after three or four years. See ALBUMEN: EMBRYO: OVARY: PLACENTA.

SEEDING, sowing either in drills or broadcast, an operation formerly conducted altogether by hand. Machines are now in use adapted to sowing the finest grass seeds or the most bulky grains and seeds.

SEEGER, ALAN, an American poet, born in New York in 1888. He was educated at Harvard University and began writing while still an undergraduate student, although little of his work became known then. He went to Paris in 1912. At the outbreak of the World War he enlisted in the Foreign Legion. He continued to write while serving in the French army and some of his poems, sent to friends in America, gradually found their way into print. The best known of his poems, perhaps, was "I Have a Rendezvous with Death." He died during an engagement at Belloi-en-Santerre, on July 3, 1916. The comparatively small number of his writings which he left were published after his death in two volumes, "Poems" (1917), and "Letters and Diary" (1917).

SEELY, JOHN EDWARD BERNARD, a British public official, born 1868. He was educated at Harrow, and Trinity College, Cambridge, and was called to the bar, Inner Temple, in 1897. He joined the army and commanded as colonel the Hampshire Carabineers, serving with the Imperial Yeomanry in South Africa in 1900–1. He represented in parliament the Isle of Wight, 1900–6, the Abercromby Division of Liverpool, 1906-10, and since 1910 the Ilkeston Division of Derby. He was Under-Secretary for the colonies 1908–1910; Secretary of State for War 1912–1914, and in 1919 Under-Secretary of State for Air and President of the Air Council.

SEELYE, LAURENUS CLARK, an American educator; born in Bethel, Conn., Sept. 20, 1837; was graduated at Union College in 1857; studied in the Universities of Berlin and Heidelberg; became pastor of the North Congregational Church, Springfield, Mass., in 1863; and Professor of Rhetoric and English Literature in Amherst College in 1865. He was chosen president of Smith College in 1873 and president emeritus in 1910.

SEER, a weight in India, formerly varying in different parts of the country, but by an act of the Anglo-Indian Government (Oct. 31, 1871), the seer was adopted as the primary standard of weight, and made equivalent to a kilogramme.

SEGESTA, in antiquity a city of Sicily; situated near the coast, 27 miles W. S. W. of Palermo. It was an ally of Athens in the Peloponnesian War, became a dependent of Carthage about 400 B. C., and passed under Roman supremacy at the time of the first Punic War. There still remain the ruins of a Greek theater and a Greek temple, the latter being one of the most complete examples extant of Greek architecture. Near the ancient site of Segesta is now the modern town of Catalafimi.

SEGMENT, in comparative anatomy, one of the divisions or rings in the body of an insect, an annelid, a decapod, crustacean, etc. In geometry, a segment is a part cut off from any figure by a line or plane. The segment of a circle is a part of the area of a circle included between a chord and the arc which it subtends. An angle in a segment is the angle contained by any two straight lines drawn from any point in the arc and terminating in the extremities of the chord. Similar segments of circles are those which contain equal angles, or whose arcs contain the same number of degrees. A spherical segment is a portion of a sphere bounded by a secant line and a zone of the surface. If a circular segment be revolved about a radius drawn perpendicular to the chord of the segment, the volume generated is a spherical segment.

SEGNO (sā'nyo), in music, a sign or mark used in notation in connection with repetition. *Al segno* (to the sign), a direction to return to the sign; *dal segno* (from the sign), a direction to repeat from the sign.

SEGOVIA, an old city of Spain; at the N. foot of the Sierra de Guadarrama; 32 miles N. N. W. of Madrid. It occupies a rocky eminence 3,300 feet above sea-level, is surrounded by ruinous walls with round towers, and consists of narrow uneven streets, with old, quaint, and stately houses, and numerous parish churches and convents. The fortress or castle is perched on the W. extremity of the rocky height, and was originally Moorish, but has been gradually restored since its destruction by fire in 1862; its towers and windows command magnificent views. The cathedral (1521–1577) is one of the finest specimens of late Gothic in Spain. The grand aqueduct, built in the time of Trajan, is a very fine example of Roman

architectural work. It consists of two rows of arches, the one resting on the other, some 2,600 feet long and 102 feet high. Wool scouring and the manufacture of paper, pottery, and cloth are carried on. Segovia was a place of importance during the time of the Romans, and was frequently the residence of the kings of Castile and Leon. The unresisting town was sacked in 1808 by the French. Pop. about 15,000.

SEGREGATION, in geology, that process in nature by which, when a mixed mineral mass has been deposited or accumulated, and left to the influence of the chemical forces always operating, certain minerals tend to separate themselves from the mass, and collect into natural cracks or blisters, either previously existing or formed during the operation.

SEICHEPREY, a small village in France which gave its name to the first serious engagement between the American troops and the Germans during the World War. Various minor engagements had already taken place, in which small forces of Americans had distinguished themselves, to the cost of the German military reputation, and it was, therefore, decided by the German higher military authorities that the Americans must be dealt a blow of considerable magnitude, to retrieve the bad impression already made among the German public. The American sector running eastward of the famous St. Mihiel salient was chosen as the location of the punishment. Here lay the village of Seicheprey, among the rolling hills. The assault came on the Americans at this point at sunrise, on April 20, 1918. The Germans were at first successful, in that they drove the Americans out of the village, but on the following day the Americans counter-attacked, supported by the French, and drove the Germans back, the net result being a decided defeat for the Germans.

SEIDEL, EMIL, an American socialist leader, born in Ashland, Pa., in 1864. From 1885 to 1893 he learned wood carving in Germany. Upon his return he settled in Milwaukee, Wis. He became one of the organizers of the wood carvers' union and one of the founders of the local socialist party organization. In 1902 he was an unsuccessful candidate for the governorship of Wisconsin; from 1904 to 1909 he served as alderman of Milwaukee. In 1910 he was elected Mayor of Milwaukee, being the first socialist holding this office in any city of importance in the United States. He was defeated for re-election in 1912. He was unsuccessful as the socialist candidate for the United States Vice-Presidency in 1916.

SEIDL, ANTON, a Hungarian orchestra conductor; born in Budapest, Hungary, May 6, 1850; educated in Budapest and in Leipsic and Beyreuth, under Richter and Wagner. In 1876, on the production of the "Nibelungen" drama in Beyreuth, he was stage director. He obtained the position of conductor at the Leipsic Opera House in 1879 through Wagner's influence. In 1882 he made a tour of Europe as conductor of the Nibelungen Opera Troupe. In 1883 he was appointed conductor of the Bremen Opera House, where he remained till 1885; when he became conductor of German opera in New York City, succeeding Dr. Leopold Damrosch. He afterward directed the concerts of the Philharmonic Society in that city, succeeding Theodore Thomas. He died in New York City, March 28, 1898.

SEIDLITZ POWDER, a mild, cooling aperient, made up in two powders, one, usually in blue paper, consisting of a mixture of Rochelle salt and bicarbonate of soda, and the other, in white paper, of finely powdered tartaric acid. The powders are dissolved separately in water, then mixed, and the mixture taken while effervescing. It is intended to produce the same effect as Seidlitz water.

SEIGNIORAGE, an ancient royalty or prerogative of the crown, whereby it claimed a percentage upon the bullion brought to the mint to be coined or to be exchanged for coin. No seigniorage is now charged for coining gold in Great Britain, but a considerable seigniorage is levied on the silver and copper currencies. As used in the United States, the term seigniorage means the profit arising from the coinage of bullion.

SEINE (sēn), a large net for catching such fish as mackerel and pilchard. It is often 160 to 200 fathoms long, and 6 to 10 broad, and is buoyed by corks and weighted so as to float perpendicularly.

SEINE (sain), a river of France, rising in the department of Côte d'Or; 20 miles N. W. of Dijon, running N. through Champagne to Troyes, where it receives the Aube, and, turning W. is joined by the Yonne, and before reaching Paris, by the Marne, becomes a larger stream, flowing from the W. At Paris the Seine varies from 300 to 500 feet in width, and it soon after receives an addition by the influx of the Oise, when, pursuing a winding course to the N. W., it passes Rouen, and discharges itself into the sea at Havre-de-Grace. Length, 482 miles, for 350 of which it is navigable.

SEINE, the smallest, but most important and wealthiest department of France, entirely surrounded by the department

Seine-et-Oise; area, 185 square miles. The surface is generally level, with few hills—Mount Valerien, 450 feet (strongly fortified), and Montmartre, 344 feet, being the highest. The soil is calcareous, but rendered productive by manure supplied from the capital. It is traversed by the river Seine. Products, principally vegetables and fruits for the Paris markets; capital, Paris. Pop. about 4,150,000.

SEINE-ET-MARNE, a department in the N. E. of France, comprising a part of the old province of Ile-de-France, having N. the departments Oise and Aisne, E. Aube and Marne, S. Yonne and Loiret, and W. Loiret and Seine-et-Oise; area, 2,275 square miles. The surface is undulating, and the soil fertile. Rivers, Seine, Marne, Yonne, and Ourcq. Products, wheat, oats, rye, barley, potatoes, etc. Numerous cattle and sheep are raised. Manufactures before the World War, cotton and linen fabrics, hardware and cutlery, earthenware, leather and paper. Chief towns, Melun, the capital, Coulommiers, Fontainebleau, Meaux, and Provins. The department suffered severely in the German invasion of France in 1914. Meaux was the point nearest to Paris reached by the German armies. Pop. about 363,500.

SEINE-ET-OISE, a department of the N. of France, having N. the department of Oise, E. Seine-et-Marne, S. Loiret, and W. Eure and Eure-et-Loire; area, 2,184 square miles. The surface is undulating, and the soil generally fertile. Rivers, Seine, Marne, and Oise. Products, wheat, oats, fruit, vegetables, and cattle. Manufactures, woolens and printed fabrics, Sèvres porcelain, leather, chemicals, and hardware. Chief towns, Versailles, the capital, Mantes, Pontoise, Rambouillet, Étampes, and Corbeil. Pop. about 818,000.

SEINE-INFÉRIEURE, a maritime department of the N. of France, formerly comprising most of the province of Normandy, having N. and W. the British Channel, E. the departments of Somme and Oise, S. Eure and Calvados; area, 2,448 square miles. The surface is hilly and well wooded. The soil is generally fertile. Rivers, the Seine and its affluents. Products, wheats, oats, barley, rye, flax, hemp, hops, and fruits. Manufactures, woolens and cottons, shipbuilding. Chief towns, Rouen, the capital, Dieppe, Havre, Yvetot. Pop. about 877,000.

SEIR FISH, or SEER FISH, the *Cybium gutatum*, one of the *Scombridæ* from East Indian seas. In form and size it resembles a salmon, and its flesh, though white, is firm, and very similar to salmon in flavor.

SEISIN, or SEIZIN, a right to lands and tenements. In common law seisin signifies possession, as to seize is to take possession of a thing. Seisin is properly applied to estates of freehold only, so that a man is said to be seized of an estate of inheritance, but to be possessed of a chattel interest. There is a seisin in deed, or in fact, when an actual possession is taken, and a seisin in law where the lands have descended to a person but he has not yet actually taken possession of them. Seisin in deed is obtained by actually entering into the lands. In some of the States, as Pennsylvania, Massachusetts, Ohio, and Connecticut, seisin means merely ownership; and the distinction between seisin in deed or in law is not known in practice.

SEISMOLOGY, the study of earthquakes. Though seismology can scarcely be said to have existed before the early part of the 19th century, it has a rapidly growing bibliography, and is accumulating a store of facts and observations on which generalizations may be based. See EARTHQUAKE.

SEISMOGRAPH, a seismometer; an instrument for recording the period, extent, and direction of each of the vibrations which constitute an earthquake. For a complete seismography, three distinct sets of apparatus are required: (1) To record horizontal motion; (2) to record vertical motion; and (3) to record time. The horizontal and vertical motions must be written on the same receiver, and if possible side by side, while at the instant at which the time is recorded a mark must be made on the diagram which is being drawn by the seismograph. The first instruments were merely modifications of the seismoscope, but successive improvements have been introduced, and the seismograph has been brought to a high pitch of perfection. Some of the best, if not the best forms known are in use in the Imperial Observatory at Tokio, Japan.

SEISTAN, or HAMOON, LAKE, a large, irregularly shaped, shallow lake or swamp in the W. of Afghanistan, close to the frontier of the Persian province of Khorassan, a division of which province (mainly steppe) is named Seistan after it. The lake is not a single expanse of water, but is divided into three depressions. A great part of the area is generally dry; but, as the basin has no outlet, when the Helmund and its other feeders are in flood this lake regularly overflows its boundaries, fertilizing large tracts of country.

SEJANUS, ÆLIUS, the son of a Roman knight, and noted as the favorite of

Tiberius, was born at Vulsinii in Etruria. He was commander of the prætorian bands, acquired the confidence of Tiberius, and aimed at the supreme power. He contrived to remove all the members of the imperial family who stood between him and power, but having awakened the suspicion of Tiberius he was executed in A. D. 31.

SEL D'OR, a double hyposulphite of gold and sodium, used in photography for toning positive paper-proofs.

SELECTIVE DRAFT LAW, a distinctive name given to the measures passed by the United States Congress in 1917, providing for the drafting of men of military age into the armed forces, for service in the World War. See UNITED STATES, section, UNITED STATES IN THE WORLD WAR.

SELENITE, a name used by some mineralogists for all species of gypsum, by others applied to the crystallized forms only.

SELENIUM, a non-metallic hexad element occupying an intermediate place between sulphur and tellurium: Symbol Se; at. wt. 79.5. It was discovered by Berzelius in 1817. Though not very abundant in nature, it enters into the composition of many minerals, and has been found in the free state in certain parts of Mexico. It is prepared from cuproplumbic selenide by heating the pulverized ore with hydrochloric acid, igniting the insoluble residue with an equal weight of black flux and dissolving out the selenide of potassium with boiling water. By exposing this solution to the air selenium is deposited as a gray powder. Like sulphur, it occurs in the amorphus and crystalline states. In the former it may be drawn out into ruby-colored threads, and when melted and quickly cooled becomes vitreous with a sp. gr. of 4:3, and nearly insoluble in bisulphide of carbon. In the crystalline condition it forms monoclinic prisms of sp. gr.=4.5-4.7. It boils below a red heat and gives off a deep yellow vapor which condenses in scarlet flowers, and when thoroughly heated burns with a blue flame forming selenious anhydride. It is oxidized and dissolved by nitric acid, yielding selenious acid. It is used in certain electric contrivances on account of the changes its electric resistance undergoes when it is subjected to light.

SELEUCIA, the name of several ancient cities of Asia, situated in Assyria, Margiana, Syria, Mesopotamia, Cilicia, Pamphylia, Pisidia, Caria, and other countries, of which the following are the most important. (1) SELEUCIA ON THE TIGRIS was founded by Seleucus I. of Syria, on the left bank of that river, near its junction with the royal canal of Babylonia, and opposite to the mouth of the Delas (now Diala) river, a little S. of the modern city of Bagdad. Commanding the plains of the Tigris and Euphrates and the principal caravan roads of Assyria and Babylonia, on the confines of which it was situated, and peopled by settlers from various countries of western Asia, it rapidly rose in wealth and splendor, and, eclipsing Babylon, became the capital of that part of Asia, till it was in its turn eclipsed by Ctesiphon, built by the Parthians on the opposite bank of the Tigris. The later wars of the Romans against that people proved destructive to Seleucia. A city of upward of 500,000 inhabitants in the 1st century, in the following it was burned by Trajan and Lucius Aurelius Verus, and captured by Septimius Severus, and in the expedition of Julian against the Persians, in the 4th century, was found deserted. (2) SELEUCIA PIERIA, a strong fortress of northern Syria, also founded by Seleucus I., whose remains were preserved there in a mausoleum, was built at the foot of Mount Pieria, on a rock overhanging the Mediterranean a few miles N. of the mouth of the Orontes, and W. of Antioch, with which it was simultaneously founded, and of which it formed the seaport. It surrendered to Ptolemy III. of Egypt, was recovered by Antiochus the Great, and in the latter period of the Syrian kingdom became independent. Under the Romans it rapidly decayed. Considerable ruins of its harbor, fortifications, and necropolis are still to be seen.

SELEUCIDÆ, a dynasty of kings who succeeded to that portion of the empire of Alexander the Great which embraced the Asiatic provinces, and is generally known as Syria. SELEUCUS I., surnamed Nicator, the founder of the line, born about 358 B. C., was a general of Alexander the Great, shortly after whose death (323 B. C.) he obtained the satrapy of Babylon. Subsequently Antigonus forced him to withdraw into Egypt (316 B. C.), but having induced Ptolemy, the governor of Egypt, along with Lysimachus and Cassander, to take the field against Antigonus, he was enabled to return to Babylon in 312 B. C. He gradually extended his possessions from the Euphrates to the Indus, assumed the title of king in 306, and latterly acquired Syria and the whole of Asia Minor, but was assassinated in 280 B. C. He is said to have been the most upright of Alexander's successors, and was the founder

of Antioch and other cities. He was succeeded by his son Antiochus I. and by a number of monarchs of the name of Seleucus and Antiochus, the most distinguished being Antiochus the Great. The power of the Seleucidæ began to decline as early as the reign of Seleucus II. (246-226 B. C.), and they successively lost, through revolts and otherwise, Bactria, Parthia, Armenia, Judea, etc., and what subsequently remained was converted into a Roman province in 65 B. C. See ANTIOCHUS.

SELF-DENYING ORDINANCE, a measure carried through the British Parliament in 1645 by the influence of Cromwell and the Independents, by means of which generals who were either less efficient or but half-hearted in the cause were removed from the command of the army. After Manchester's lack of energy at the second battle of Newbury (Oct. 27, 1645), Cromwell had determined on a change of tactics, and attacked Manchester in Parliament, but he soon found the more sweeping measure a better means toward his ends. The lords threw out the measure, whereupon the Commons proceeded to form a new army under Sir Thomas Fairfax as general-in-chief. The lords now passed the measure with some alterations and called on all existing officers to resign. Thus Essex, Waller, and Manchester were got rid of, while Cromwell was specially reappointed to the command of the cavalry as lieutenant-general.

SELFRIDGE, H(ARRY) GORDON, an American merchant, born in Ripon, Wis., in 1858. He received a public school education and, entering the employ of Field, Leiter & Co. in 1879, he was advanced until he became a partner of Marshall Field & Co., and manager of the retail store. In 1904 he sold his interests and retired, and afterward engaged in business in Chicago under the firm name of H. G. Selfridge & Co. In 1906 he organized in London, Selfridge & Co., Ltd., and in 1909 built and opened one of the largest retail stores in Europe. He wrote "The Romance of Commerce."

SELFRIDGE, THOMAS OLIVER, an American naval officer; born in Charlestown, Mass., Feb. 6, 1836; son of rear-admiral of same name, graduated at U. S. Naval Academy in 1854, and promoted lieutenant in 1860. During the Civil War he was serving on board the "Cumberland" when she was sunk by the "Merrimac" in Hampton Roads in 1862; commanded the ironclad "Cairo," which was blown up on the Yazoo river; had charge of a battery at the capture of Vicksburg; participated in both attacks on Fort Fisher, and commanded several vessels in the Mississippi fleet. He was promoted commander in 1869 and had charge of the surveys for the canal across the Isthmus of Darien in 1869-1874; was a member of the International Congress at Paris in 1876 and in 1896 was promoted rear admiral. He was retired, Feb. 6, 1898.

SELIGMAN, EDWIN ROBERT ANDERSON, an American educator; born in New York City, April 25, 1861; was graduated at Columbia University in 1879; then studied abroad; became Professor of Political Economy and Finance at Columbia University in 1891; editor of the Political Science Quarterly. He was a member of New York Mayor's Tax and Finance Committee, 1905; President of Roosevelt's Committee on Statistics and Reorganization, 1908; Chairman of trustees, Bureau of Municipal Research, 1905-1910; President, Am. Science Ass'n and of National Tax Association. His publications include "Railway Tariffs" (1887); "Finance Statistics of American Commonwealths" (1889); "The Shifting and Incidence of Taxation" (1899); "Progressive Taxation in Theory and Practice" (1894); "Essays in Taxation" (1900); "Principles of Economics" (1919).

SELIM, the name of three emperors of the Turks. SELIM I., son of Bajazet II.; born 1467; dethroned his father and killed his two brothers, 1512; defeated the Shah of Persia 1514; conquered Syria and Egypt 1516-1517; died 1520. SELIM II., succeeded his father, Soliman II., in 1566; took Cyprus from the Venetians 1570, and Tunis from the Spaniards in 1571. In the same year he lost the great naval battle of Lepanto; died 1574. SELIM III., son of Mustapha III.; born 1761, succeeded his uncle, Abdul-hamed, 1789. He was ambitious to become a reformer, but the ill fortune of the Turks in the wars with Russia and Austria, and the numerous rebellions and insurrections in the empire, long prevented his attempting the task. War with France followed, and Egypt was conquered, but it was recovered by the English and restored to Selim. In 1800 he became protector to the Ionian Islands. The organization and discipline of the army, the constitution of the divan, and the system of taxation were the matters which he sought to regulate. War with Russia again broke out in 1806, the new army organization, Nizam Jedid, excited immense dissatisfaction, and in May, 1807, the Janizaries revolted, and Selim was deposed, imprisoned, and in the following year strangled in Constantinople, July 28, 1808.

SELINUS, one of the most important of the Greek colonies in Sicily, founded probably about 628 B. C. on the S. W. coast of that island. Thucydides mentions its great power and wealth, and the rich treasures of its temples. It was conquered by the Carthaginians in 409, and in 249 destroyed by them. There are still important ruins of ancient Greek temples here.

SELJUKS, a division of the Ghuzz confederacy of the Turkish tribes, who were settled on the Jaxartes and in Transoxiana in the 11th century, when they became converts to Islam. Togrul Beg, grandson of a chief named Seljuk (whence the name of the several successive dynasties), severely crippled the empire of Ghazni (1040); then turning W. conquered all Persia, and 10 years later he marched on Bagdad, to the assistance of the Abbasside Caliph, a mere "do-nothing" sovereign, who existed by the favor and protection of a powerful family of the Shîite faith. The head of this family (the Bowides) was, however, the master rather than the protector of the caliph. Togrul seized and supplanted him and being of the orthodox Sunnite faith, was nominated by the caliph "Commander of the Faithful." Dying in 1063, Togrul was succeeded by his nephew, Alp Arslan. This sovereign wrested Syria and Palestine from the rival Fatimite caliph of Egypt, and in 1071 defeated the Byzantine emperor Romanus Diogenes, and captured him. The price of his release was a heavy ransom and the cession of great part of Anatolia or Asia Minor to the Seljuk. Alp Arslan was stabbed by a captive enemy in distant Turkestan (1072), and was succeeded by his son Malik Shah. His reign is chiefly remarkable for the enlightened rule of his grand vizier, Nizam ul-Mulk, the schoolfellow of Omar Khayyam, the poet, and of Hassan ben Sabbah, the founder of the ASSASSINS (*q. v.*). This statesman founded a university at Bagdad, an observatory, and numerous schools and mosques, and with the help of his old friend Omar Khayyam revised the astronomical tables and introduced a new era, the Jelalian.

After the death of Malik (1092) the extensive empire began to break up into smaller kingdoms. But already during his lifetime, and even that of his predecessors, powerful tributary princes had ruled over separate provinces in Syria, in Kerman (beside the Persian Gulf), and in Asia Minor. During the first half of the 12th century the most powerful of these provincial rulers was Sinjar, who governed Khorassan, with Merv for his capital. He spent his life fighting against the Ghaznevids, against the Turkestan chiefs, and latterly against the Mongols. But a stronger and more immediate interest attaches to the province of Syria and that of Asia Minor, or Rum, as the Seljuks preferred to call it. It was the rulers of these two provinces or kingdoms who persecuted the Christian pilgrims and so provoked the CRUSADES (*q. v.*), and it was the rulers of the same two kingdoms against whom the crusaders of Europe principally fought. The capital of Rum was fixed at Iconium (Konieh) in the first half of the 12th century. This dynasty reached the acme of its power under Kaikavus (1211-1234), who ruled over nearly the whole of Asia Minor and extensive territories in Mesopotamia and northern Persia.

During the reign of his son Kaikhosrau II. the poet Jelad-ed-Din Rumi flourished and the various orders of dervishes arose; and at the same time the Mongols began to threaten the E. borders of the state. Indeed from about 1243 the real sovereign power of that part of Asia was in the hands of the Mongol chiefs, Hulagu and his successors, till the rise of the Ottoman princes. These last, Turks like the Seljuks, had retreated W. before the all-conquering Mongols about the middle of the 13th century, and at the end of it they entered the service of the Seljuk ruler of Asia Minor. After that the name Osmanli or Ottoman soon superseded that of Seljuk as the appellative of the Turkish rulers and ruling classes in Asia Minor. And out of the Ottoman supremacy grew the empire of Turkey. The Seljuks, however, had centuries before, while they were still settled in Transoxiana, lost a good many of their peculiarly Turkish characteristics and had become "Turkomans," *i. e.*, "Like the Turks"; and with their conversion to Islam they also adopted the Perso-Arabian civilization and customs, though still retaining their own language as well as using those of the peoples they had conquered.

SELKIRK, ALEXANDER, a Scotch adventurer; born in Largo, Scotland, in 1676. He was a skilful seaman, and made several voyages to the South Sea, in one of which, having quarreled with his commander, he was put ashore on the island of Juan Fernandez, with a few necessaries, a fowling-piece, gunpowder, and shot. Here he lived alone during four years and four months, and was then rescued by Captain Woodes Rogers. During the time of his remaining on the island he had nearly forgotten his native language. He returned to England in 1711, and is said to have given his papers to Defoe, who took from them his story

of "Robinson Crusoe." He died on the ship "Weymouth," in 1723.

SELKIRK MOUNTAINS, an outlying range of the Rocky mountains, in British Columbia, extending S. from about lat. 52° N. to near the United States frontier. The Canadian Pacific railway climbs over the mountains at a point 4,300 feet above the sea.

SELKIRKSHIRE, a county of southeast Scotland. Area, 267 square miles. Pop. about 25,000. Almost its entire area is occupied by two parallel valleys of the rivers Ettrick and Yarrow. The county is mountainous. The various mountains, the highest of which is Dun Rig (2,433 feet), have round, instead of peaked tops, and the mountain sides are covered with a high quality grass, providing excellent pasturage. Formerly there were extensive woods, which, however, have now disappeared. Capital, Selkirk, with a population (1918) of 5,946.

SELLAR, WILLIAM YOUNG, an English critic; born in Morvich, Sutherland, Feb. 22, 1825; was educated at Edinburgh Academy and Glasgow University, from which he passed to Balliol College, Oxford. In 1850 he was elected to a fellowship at Oriel; next acted as assistant professor at Durham, Glasgow (1851-1853), and St. Andrews (1853-1859); filled for six years the Greek chair at St. Andrews; and was elected in 1863 to the Latin chair at Edinburgh, which he retained till his death near Dalry, Galloway, Oct. 12, 1890. He made his name widely known by his learned and brilliant book, "The Roman Poets of the Republic" (1863; revised and enlarged, 1881), which was followed by "The Roman Poets of the Augustan Age —Vergil" (1877), and "Horace and the Elegiac Poets" (1892), the latter edited from his papers by his nephew, Andrew Lang, with a brief memoir prefixed.

SELLS, CATO, an American public official, born at Vinton, Iowa. He studied at Cornell College, Mount Vernon, Iowa. In 1884 he was admitted to the bar. He practiced at Laporte City, served as its mayor, and in 1891 was elected state's attorney. From 1894 to 1899 he was United States district attorney. In 1907 he removed to Cleburne, Tex., where he engaged in the banking business. He was appointed commissioner of Indian Affairs by President Wilson in 1913.

SELMA, a city and county-seat of Dallas co., Ala.; on the Alabama river, and on the Western of Alabama, and the Louisville and Nashville and other railroads; 50 miles W. of Montgomery. Here are Dallas Academy, Alabama Methodist Orphanage, public library, Y. M. C. A., Alabama Baptist Colored University, and other public buildings, electric lights, National and State banks, and several daily and weekly newspapers. There is regular steamboat connection with Mobile. The city has an ice factory, cottonseed oil mill, railroad machine and carwheel shops, a planing mill, iron works, engine works, extensive cotton factories, etc. During the Civil War the city contained an arsenal, extensive powder works, and a gun foundry. It fell into the hands of the Union forces a few days before the surrender of General Lee. Pop. (1910) 13,649; (1920) 15,589.

SELOUS, FREDERICK COURTENAY, an English explorer; born in London, Dec. 31, 1851. He made a name as a gold prospector, explorer, and elephant hunter in South Africa, where he spent many years; and during the Matabele campaign fought on the side of the colonists. In 1909-1910 he organized and conducted the Roosevelt hunting expedition in E. Africa. Though over 60 when the World War broke out he obtained in 1915 a commission as lieutenant of Fusileers. Promoted captain D. S. O. 1916. Killed in action in E. Africa in 1917. He wrote: "A Hunter's Wanderings in Africa" (1881); "Travel and Adventure in Southeast Africa" (1893); and "Sunshine and Storm in Rhodesia" (1896), etc.

SELTZER WATER, a carbonated mineral water imported from Lower Selters, in the duchy of Nassau. It contains common salt and the carbonates of soda, magnesia, and lime, and is recommended as a mild stimulant and diuretic. An artificial seltzer for domestic use is prepared by adding minute quantities of common salt and carbonate of soda to distilled water, and highly impregnating with carbonic acid gas.

SELWYN, GEORGE AUGUSTUS, an English bishop; born April 5, 1809; was educated at Eton and at Cambridge; rowed in the first inter-university boat race (1829); and was a great pedestrian and swimmer, athletic powers found very serviceable in after life. In 1841, while curate of Windsor, he was consecrated first and only Bishop of New Zealand and Melanesia—now divided into seven sees. On the voyage out he studied Maori and navigation. He visited every portion of his huge diocese before setting about his great work of organizing it. A visit to England in 1854 brought back John Coleridge Patteson, afterward the martyred Bishop of Melanesia, to whose see Bishop Selwyn's second son was con-

secrated in 1877. In 1867 Bishop Selwyn attended the first Pan-Anglican Synod at Lambeth, and against his own inclinations was appointed Bishop of Lichfield —the see of the Black Country—where on his initiative the first Diocesan Conference in which the laity were duly represented met in 1868, and where he died, April 11, 1878.

SEMAPHORE, a kind of telegraph or apparatus for conveying information by visible signs, such as oscillating arms or flags by daylight, and by the disposition of lanterns by night. The various combinations may serve to indicate the numbers corresponding to certain expressions in a tabulated code, or may be employed to represent the letters of the alphabet. A simple form is used on railroads.

SEMBRICH, MARCELLA, an Austrian opera singer; born in Lemberg, Poland, Feb. 18, 1858; received her first instruction on the piano and soon afterward took up the study of the violin. In 1876 she gave up her instrumental work to study singing, and went to Milan, where for nearly three years, she was a pupil of Lamberti. Her first appearance was in "I Puritani," at Athens, where her singing attracted considerable attention. Subsequently she appeared in all the large cities of Europe with great success, and in 1883 came to the United States. She reappeared in concerts in the United States in 1897-1898, in 1898-1899 was a member of the Grau Opera Company and the principal coloratura soprano of the New York Metropolitan Opera Company, 1903-1909. She retired from the operatic stage in 1909 but continued to give concerts and recitals. She worked for the relief of the suffering in Poland during the World War.

SEMELE, in classical mythology, a daughter of Cadmus by Hermione. She was beloved by Jupiter; but Juno, determining to punish her rival, visited the house of Semele in the guise of her nurse, and persuaded her to entreat her lover to come to her with the same majesty as he approached Juno. Jupiter had sworn by the Styx to grant Semele whatever she required; he therefore came attended by the clouds, the lightning, and thunder-bolts. Semele, unable to endure so much majesty, was instantly consumed by fire. Her child was, however, saved from the flames by Mercury. This child was called Bacchus, or Dionysius.

SEMICOLON, in grammar and punctuation, the point (;), marking a greater distinction of sense than a comma, but less than a colon. It is used to distinguish the conjunct members of a sentence.

SEMINOLES, a tribe of American Indians, originally a vagrant branch of the Creeks, whose name, *Seminole*, signifies "wild" or "reckless." In 1805, they aided in driving the Appalaches from Florida; and in 1817, they joined with the Creeks and some negroes who had taken refuge with them, ravaged the white settlements in Georgia, plundering plantations, and carrying off slaves, whom they refused to surrender. General Jackson, sent to punish them, took at the same time several Spanish forts, and hastened the negotiations which ended in the cession of Florida to the United States. By this cession, in 1823, the Seminoles engaged to retire into the interior and not molest the settlers; but as the negroes continued to take refuge with them, a treaty was made with some of the chiefs, in 1832, for the removal of the whole tribe W. of the Mississippi. This treaty was repudiated by the tribe, at the instigation of OSCEOLA (*q. v.*), one of their chiefs. A war commenced, in which battles and skirmishes were of constant occurrence, and with various results. This war, which lasted seven years, and cost the government about $10,000,000 and the loss of 1,466 lives, ended in 1842, when the Seminoles, except some 200 who took refuge in remote places, were removed to the Indian Territory, where nearly all the members of the tribe are now settled. They number (1920) about 3,000, receive an annuity, have churches, and are under the training of missionaries of the Presbyterian denomination. The remnants in Florida number about 700.

SEMIPALATINSK, a territory of Central Asia. It belongs to Russia and is an administrative division of the Steppes. Its area is 184,626 square miles, the principal river being the Irtysh. There are many lakes and the minerals include gold, silver, lead, copper, and coal. Agriculture is being developed, but is hindered by storms and lack of irrigation. The population is made up largely of the nomadic Kirghizes, who engage chiefly in stock raising. Pop. (1915) 874,900. The capital is Semipalatinsk, which has mosques, library and cathedral, and nearby the Tongus ruins. Pop. about 35,000.

SEMI-PELAGIANISM, in Church history, a modification of the doctrines of the Pelagians, consisting chiefly in maintaining the sufficiency of man's natural power, only so far as regards the first act of conversion to God, and the initial act of man's repentance for sin. Semi-Pelagianism took its rise in 428, from John Cassian, a pupil of Chrysostom at Marseilles. The Council of Orange, July

3, 529, established the Augustinian doctrines in opposition to those of the Pelagians and Semi-Pelagians, as did that of Valencia, in July or August, 530; and Pope Boniface II. confirmed the decree in 530.

SEMIQUAVER, in music, a note half the length of the quaver.

SEMIRAMIS, a queen of Assyria, whose history is enveloped in fable. As the story goes, she was a daughter of the fish goddess Derceto of Ascalon, in Syria, by a Syrian youth. Being exposed by her mother, she was miraculously fed by doves till discovered by the chief of the royal shepherds, who adopted her. Attracted by her beauty, Onnes, governor of Nineveh, married her. She accompanied him to the siege of Bactria, where, by her advice, she assisted the king's operations. She became endeared to Ninus, the founder of Nineveh (about 2182 B. C.), but Onnes refused to yield her, and being threatened by Ninus, hanged himself. Ninus resigned the crown of Semiramis, and had her proclaimed Queen of Assyria. She built Babylon, and rendered it the mightiest city in the world. She was distinguished as a warrior, and conquered many of the adjacent countries. Having been completely defeated on the Indus, she was either killed or compelled to abdicate by her son Ninyas, after reigning 42 years. According to popular legend, she disappeared or was changed into a dove, and was worshiped as a divinity. Her whole history resembles an Oriental tale, and even her existence has been questioned. She is probably a mythological being corresponding to Astarte, or the Greek Aphrodite.

SEMITES, a name given by J. G. Eichhorn in 1787 to a group of nations closely allied in language, religion, manners, and physical features, who are represented in Gen. x. as descended chiefly from Shem, a son of Noah. Their habitat was Abyssinia, Arabia, Palestine, Phœnicia, Syria, and the countries of the Euphrates and Tigris. Into those lands, according to one theory which is supported by Lenormant and others, there had preceded them an immigration of Cushites of the Hamitic race, who, proceeding from Central Asia, occupied not only the lands that afterward became Semitic, but also the Nile valley. Their Hamitic language and civilization, the Semites are said to have adopted. In language the Semites do show some affinity with the Berbers and the inhabitants of the Nile valley. The increasingly prevalent theory is that not less than 4000 B. C. the Semites migrated as nomadic tribes, probably from Arabia, into Mesopotamia. There they found a Turanian population dwelling in cities built of brick, under the regular government of priest kings, skilled in the use of metals, using the cuneiform mode of writing, and comparatively far advanced in literature and culture. In 3800 B. C. the Semitic adventurer Sharrukin usurped the kingdom of Accad. In Elam also the Turanian population was early overpowered by the intruding Semites, who came to form the upper strata of society. In 2280 B. C. the Semite Khudur-Nankhundi of Elam invaded and conquered Shumir and Accad, founding the Elamite line of princes; and about 2200 B. C. one of his successors, Khudur-Lagamar (Chedorlaomer), carried his conquests as far as Palestine (Gen. xiv.).

These painful and oppressive impulses seem to have occasioned emigrations of many Semites. Some proceeded toward the N. W., reached the Mediterranean Sea, founded Sidon, Tyre, and other cities, and became known afterward as Canaanites or Phœnicians. Later, from Ur went others in the same direction, settled behind the Phœnicians, and were afterward known as Israel. Others went N. and built cities which developed into the empire of Assyria. While the Semites were in Mesopotamia they used the Turanian language in their public documents till they attained the ascendant in political power; and when afterward they used their own language they continued to use the Turanian cuneiform mode of writing. The Turanian religion also was adopted by the Semites, and mixed with what religion their own primeval tribal religion or totemism had developed into. This amalgamation was consummated by Sharrukin II. of Accad about 2000 B. C.

The Semites as a race have a fine physical organization, are mentally quick, clever, but not inclined to change, and not persistent in progress. Their literature has neither epic nor dramatic poetry worth notice. Almost their only arts are the sculpture of Assyria, the exquisite glass and pottery, and the textile fabrics and embroidery of the Phœnicians. They have made their mark on the world in the Phœnician commerce, which visited even the Atlantic shores of Spain and France and drew tin from Britain; in the Phœnician colonies, which, dotting all the coasts and many islands of the Mediterranean Sea as far as Cadiz, and the coast of Asia as far as India, dispensed manufactures in the Carthaginian empire within Europe and Africa; in the exploits of Hannibal; in the dissemination of alphabetic writing, whereof the Phœnician form was the mother of the

European and of most Asiatic alphabets, while the alphabet of the great Sabæan kingdom, or of the great and still more ancient Minæan kingdom in Arabia, is apparently the oldest of all alphabets hitherto discovered; in the Babylonian and Assyrian empires; in the Hebrew Bible and the Jewish religion; in the New Testament and the Christian religion; in the Koran and the Mohammedan religion; in the Mohammedan conquests and empire; and in the preservation of culture thereby during the Dark Ages and the Middle Ages.

SEMITIC LANGUAGES, the languages spoken by the Semitic nations. One characteristic feature of them is triconsonantal roots from which by prefixed or affixed letters, but mostly by internal vowel changes, the other words are formed. Thus in Arabic *kâtăbâ*="he wrote," *bâtib* ="a scribe," *kitâb*="a book," *maktûb*— "an epistle." Another characteristic feature is that, though personal pronouns are affixed to nouns, verbs, and prepositions, there is an almost total absence of derivative nouns, adjectives, and verbs. Thus, while in Arabic *beitî*="*my* house," *qatalahu*="he killed *him*," *minhâ*= "from *her*," there are no such derivatives as pro-motion, dread-ful, frati-fy. The most highly developed, and on the whole the most characteristic (probably also the oldest of the group), is Arabic, which, with its ancient Sabæan, and Minæan dialects of southern, western, and northern Arabia, and with Ethiopic, forms the S. division of Semitic languages, marked by the use of "broken plurals," in which the consonants of the singular are presented, while the vowels are as much altered as possible. Thus from the Arabic *kitâb*, "a book," comes the plural *kŭtŭb*. Another mark is the universal use of *a* before the third radical letter of the active preterites; thus Arabic has *qáttala, áqtala*, for which Hebrew has *qittêl* and *hiqtîl*.

Hebrew, though a characteristically Semitic speech, shows many marks of linguistic decadence; ancient Hebrew is a more modern type of language than modern Arabic. Phœnician differs little in grammar and dictionary from Hebrew. In the African territory of Carthage this language was spoken 400 years after the Christian era; a century before that era in Phœnicia itself it yielded to Aramæan or to Greek. Moabitic, as the Moabite Stone of the 9th century B. C. shows, was Hebrew. Aramæan had its home in Aram of Damascus and Aram of Mesopotamia. It was the language of Assyria from early times, as we may see in II Kings xviii., and of Babylonia, even while Assyrian was used there for official purposes. It was the official language of the provinces of the Persian empire W. of the Euphrates. Its W. branch was the language of Palmyra and of the N. part of the Arabian kingdom of the Nabatheans, and is seen in the Biblical books of Ezra and Daniel, where it has been erroneously named Chaldee. Later developments of this branch are the officially recognized "Targums" by Onkelos on the Pentateuch, and Jonathan on the Prophets, which were finally edited and fixed in the 4th or 5th century A. D. in Babylonia. Somewhat later are some "Midrashes," the Jerusalem "Targums," and the Jerusalem "Talmud." Of the 4th or 5th century are Palestinian translations of the Gospel. Samaritan is another branch of western Aramæan, written in a Hebrew alphabet older than the Captivity, and spoken about 432 B. C. by an Aramæan people with Israelitish blood in them, who were desirous of conforming in speech as in religion to the Hebrew usage of northern Palestine. Arabic soon expelled western Aramæan after the Mohammedan conquest, though a faint echo of it still lingers in the Anti-Libanus. The Babylonian Talmud shows the common eastern Aramæan of Babylonia from the 4th to the 6th century. The language of the Mandæan sect resembles it. In the 2d century the Edessan dialect of Aramæan, which we call Syriac, began to be the language of eastern Christendom for all purposes; but for popular use it was slowly supplanted by Arabic after the Mohammedan conquest, becoming a dead and almost entirely ecclesiastical language. In the mountain regions of ancient Assyria Aramæan is still represented by several local dialects among Christians and even Jews. Assyrian, so called by us moderns because discovered by us in Assyria, is more correctly named Babylonian. It is written in the difficult, cumbrous, and inadequate cuneiform character received from the Turanian natives. It shows scarcely any sign of a preterite tense. In popular use it early gave way to Aramæan. Ethiopic, a sister tongue to Arabic, in some respects resembles more closely Hebrew and Aramæan even in the most ancient form of the language known to us.

SEMMERING, a mountain of Austria, 4,575 feet high, on the borders of Styria and lower Austria, 44 miles S. W. of Vienna. It is crossed by the Semmering railway, the first of the mountain railways in Europe. The railway is carried along the face of precipices, through 15 tunnels, and over 16 viaducts, the surrounding scenery being magnificent. It was constructed at a cost of $5,000,000

for the Austrian Government between 1848 and 1853.

SEMMES, RAPHAEL, an American naval officer; born in Charles co., Md., Sept. 27, 1809; was appointed, in 1828, a midshipman on board the "Lexington," and rose by successive steps to the rank of commander in 1855. He was nominated, in 1858, secretary to the Light-house Board, which situation he held when the war broke out. He then joined the Confederate service, March 26, 1861, and was made commander of the war steamer "Sumter." With this vessel he caused considerable damage to the United States merchant navy, and having been driven into the port of Gibraltar by stress of weather, sold her to a "neutral." He was then ordered to take the command of a vessel built in England, and known at first as "290," which afterward became famous as the "Alabama." His exploits while commander of this vessel, though not so dashing as those of Paul Jones during the first American war, were far more destructive. After having inflicted an enormous amount of loss on the National commerce, the "Alabama," which had been into Cherbourg, France, for repairs, encountered outside the harbor a United States war steamer, the "Kearsarge," Capt. John A. Winslow, June 10, 1864. A French man-of-war followed her to prevent any violation of international law. The fight took place about 9 miles from Cherbourg, and was both short and decisive. The "Kearsarge," a powerful ship, was defended by iron chains slung over the bulwarks, on which the shot of the "Alabama" could make but little impression; and in rather more than an hour from the beginning of the fight the "Alabama" was completely disabled. The crew tried to reach the French coast with her, but failed in the attempt, and she began to sink. Commander Semmes, and some of the sailors, including 13 officers, were saved by the boats of an English steam yacht, the "Deerhound," which had accompanied the "Alabama" from Cherbourg to be a spectator of the fight. Semmes succeeded, after some difficulty, in making his way back to the Southern States; but the effectual blockade of their ports deprived him of any further chance of continuing his adventurous career. He wrote the "Cruise of the Alabama and Sumter," and the "Log of the Alabama" (1864); "Memoirs of Service Afloat" (1869). He died in Mobile, Ala., Aug. 30, 1877.

SEMOLINA, a term applied to a kind of wheat meal in large, hard grains, used for making puddings, thickening soup, etc.

SEMPACH, a village of Switzerland, in the canton and 8 miles N. W. of Lucerne, on Lake Sempach. It is remarkable as being the scene of a great victory which the Swiss gained over the Austrians under Duke Leopold, who was slain, together with 600 nobles and upward of 2,000 troops. The victory was attributed to the heroism of Arnold of Winkelried.

SENATE, in ancient history, the deliberative assembly of the Roman people; but the term has been applied to very different powers and constitutions in different countries. In the Greek republics, as well as among the Romans, the number of senators was regulated by the number of tribes into which the state was divided. Accordingly, while Attica was divided into four tribes, the number of senators was 400; and when the number of tribes was increased to 10, the number of senators was also enlarged to 500. The Roman Senate, during the primitive days of the city, participated in the judicial and executive powers of the king, and even in the management of military affairs. Romulus was said to have originated the Senate; but in doing this, he only imitated all the civilized nations dwelling on the shores of the Mediterranean, who all deemed it necessary to have an assembly of the elder citizens of the state, besides a popular assembly. Under Tarquinius Priscus, the number of senators was increased to 300, each of the 300 houses (*gentes*), which composed the three tribes, having its *decurio*, or representative head, in the Senate. Subsequently, the election of the senators was made by the censor reading aloud once in every luster (five years) the names of the senators, the worthiest first; the one first named being styled *princeps senatus*. Those who were deemed unworthy of the dignity were degraded by the omission of their names. The senators were chiefly drawn from the ranks of the equestrian order. In the days of the republic, a senator was required to possess property to the value of about $22,500, and in the days of Augustus of about $32,500. The Senate was assembled by the supreme officers of government, deciding the propositions laid before it, article by article, by a majority of voices. A decree of the Senate was called *senatus consultum*. If the decree was opposed by the tribune, or if the Senate was not full, the act was termed *senatus auctoritas*, and was submitted to the people, whose tribunes could reject every proposition by their vote. The Senate had within its jurisdiction all matters of public administration, questions of peace or war, the choice of public officers, and the financial

concerns of the republic. Under the empire, the Senate gradually lost its political consideration, but till the time of Constantine the Great many of its decrees took the place of the laws enacted by the people.

In France the upper legislative chamber under Napoleon I. and Napoleon III. was called the Senate, and the name is still in use in the French republic. The Senate is composed of 314 members; they are elected indirectly for a term of nine years.

SENATE, UNITED STATES, the higher branch of Congress; composed of two senators from each State, irrespective of the population therein. Up to May 31, 1913, they were elected by the State legislatures. On that date the 17th amendment to the United States Constitution providing for the election of senators by direct popular vote and for the filling of vacancies by appointment from the Governors of the States, went into effect. Some of the most important functions of the Senate, as distinct from the House, are the supervision of the presidential appointments of the highest grade of public officers, the passing of judgment on all treaties contracted with foreign powers, and the sole power to try all impeachments. In the latter case impeachment proceedings must originate in the House, which presents the charges to the Senate; this, in turn, acts as the court. The Vice-President of the United States is president of the Senate, but has no vote therein excepting in the case of a tie, and is really an officer with very limited power. It is customary after the Vice-President has been installed as presiding officer of the Senate, for him to preside over a few sessions of that body and then ask for a leave of absence, when the Senate elects one of its own members as president *pro tem.*, and the member so chosen acts as presiding officer whenever the Vice-President does not wish to exercise that privilege.

SENECA, a lake in the W. part of New York State; 25 miles S. of Lake Ontario, into which its waters flow. It is about 37 miles long, from 2 to 4 miles broad, and 630 feet deep. It communicates with the Erie canal, and steamers ply on it.

SENECA, LUCIUS ANNÆUS, a Roman philosopher, son of M. Annæus Seneca, an eminent rhetorician; was born in Cordoba, Spain, about the beginning of the Christian era. Taken early to Rome, he became an advocate, gained some distinction, and was made quæstor. But under Claudius, an accusation brought against him by the infamous Messalina, led to his being banished to Corsica. Returning after an exile of eight years, he was intrusted by Agrippina with the education of her son Nero. He acquired over the youth an influence as strong as it was salutary, and, having already at Agrippina's instance become prætor, he was, at that of Nero (now emperor), made consul, A. D. 57. His high moral aims and intellectual gifts incurred the jealousy and hatred of the emperor, while his wealth excited Nero's rapacity. An attempt on Nero's part to poison him having failed, he was drawn into the Pisonian conspiracy, accused, convicted, and condemned. Left free to choose his mode of death, he opened his veins, and gradually succumbed to syncope, A. D. 65. His writings were very numerous, and many are still extant; among them are treatises on "Anger"; on "Consolation"; on "Providence"; on "Tranquillity of Mind"; "The Blessed Life"; 124 letters to Lucilius; 10 tragedies, and a remarkable work entitled "Speculations on Natural Phenomena." Seneca attached himself chiefly to the Stoic school but adopted also principles from other systems.

SENECA, MARCUS ANNÆUS, a Roman rhetorician; father of the preceding; a native of Cordoba, in Spain; born about 61 B. C. He went to Rome during the reign of Augustus, and there taught rhetoric with great success for several years. He died in Rome toward the close of the reign of Tiberius (A. D. 37). He was the author of a collection of extracts showing the treatment of school themes by contemporary rhetoricians.

SENECA FALLS, a village in Seneca co., N. Y.; on the Seneca river, near Cayuga Lake, and on the New York Central and Hudson River railroad; 16 miles N. of Auburn. It contains a public library, the Convent of St. Patrick, National and other banks, and several newspapers. The river here falls 50 feet and furnishes motive power for flouring, woolen and knitting mills, foundries, and manufactories of steam fire engines, pumps, and agricultural implements. Pop. (1910) 6,588; (1920) 6,389.

SENECA INDIANS, a tribe of North American Indians belonging to the Iroquois, and formerly occupying western New York and a portion of northwestern Pennsylvania. They were once powerful; and their most famous chief was Sagoyewatha, or "Red Jacket." They mostly reside in New York State still, numbering between 3,000 and 4,000.

SENECA RIVER, a river of New York State; flows E. from the N. end of Seneca Lake to the N. end of Lake Cayuga, then turns N. and is joined on

the left by the outlet of Lake Canandaigua, then turns again E., and receives in succession the drainage of the other parallel "finger lakes" to the E. (Owasco, Skaneateles, and Onondaga), then turns N. W., taking the name of Oswego river, and enters Lake Ontario at Oswego. Length (including the Oswego) nearly 100 miles.

SENECIO, the groundsel, a genus of plants, order *Asteraceæ*, remarkable as being probably the most extensive in point of species in the whole vegetable kingdom. They are spread over all parts of the globe, fully 1,000 different kinds being known to botanists. The groundsel (*Senecio vulgaris*) and the ragwort (*S. Jacobæa*), afford a good idea of the appearance of the European species, the most noteworthy of which is, perhaps, the well-known *S. cineraria*, better known in gardens as *Cineraria maritima*, extensively used for planting in flower beds for the sake of contrast with scarlet and other colors, its beautiful foliage being clothed with short white down. The golden senecio, *S. aureus*, an American species found in all the states, in meadows, woods, etc., is a handsome plant, with golden-yellow flowers.

SENEFELDER, ALOYS, the inventor of lithography; born in Prague, Bohemia, Nov. 6, 1771; died in Munich, Bavaria, Feb. 26, 1834. See LITHOGRAPHY.

SENEGAL, a river of western Africa, which rises in the interior not far from some of the Niger sources, and after a course of some 1,000 miles falls into the Atlantic near lat. 16° N. It is navigable for flat-bottomed boats, for about 740 miles from its mouth; as far as the cataracts of Félou, and for steamers (during certain months) about 650 miles.

SENEGAL, a colony of French West Africa; between the Sahara and the Gambia river; extends from the Atlantic on the W. to the French Sudan on the E.; area, 74,112 square miles. The name Senegambia, which is not used by the French, has been applied to this region, being compounded from the names of the rivers, Senegal and Gambia, between which it lies. Gold, silver, copper, and quicksilver are found. Much of the soil is rich. The natives cultivate millet, maize, and rice; other products are gums, castor-beans, ground nuts, cocoanuts, rubber, and kola. The native industries are weaving and the making of bricks, pottery, and jewelry. A railway connects the coast towns of Dakar and St. Louis; another line runs from Kayes on the coast, toward the upper Niger.

Government.—For administrative purposes the colony is divided into four communes; St. Louis (the capital and residence of the governor of West Africa), Dakar (chief port, pop. 25,468), Gorec, and Rufisque. In October, 1899, a portion of the West Sudan was placed under the same administration as Senegal. The imports in 1919 were valued at about $16,000,000, and the exports at about $14,000,000.

History.—The French first settled Senegal in 1626. It was taken by the English in 1758, retaken by the French in 1779, and subsequently held by the English till the peace of 1814. The settlements languished till the appointment of General Faidherbe as governor in 1854. He began a most vigorous line of action, subdued the Berber chiefs who prevented the French advance inland, and annexed their territories. This policy was pursued in the same spirit by subsequent governors; districts were annexed and protectorates proclaimed with extraordinary celerity, though the two powerful chiefs Ahmadou and Samory occasioned them a great deal of trouble, 1887-1890. Pop. (1919) 1,204,113.

SENESCHAL, in the Middle Ages, an officer in the house of princes and high dignitaries, who had the superintendence of feasts and domestic ceremonies; a steward. In some instances he had the dispensing of justice.

SENN, NICHOLAS, an American surgeon; born in Buchs, Switzerland, Oct. 31, 1844; removed with his parents to Ashford, Wis., in 1853; was graduated at the Chicago Medical College in 1868; followed his profession in Fond du Lac, Wis., in 1869-1874, and removed to Milwaukee, Wis., in 1874. In 1885 became a professor in the College of Physicians and Surgeons, Chicago; Professor of the Principles of Surgery and Surgical Pathology in Rush Medical College in 1888, and removed to Chicago in 1891. He was made surgeon-general of Wisconsin before his removal, and served in the field during the Spanish-American War. His publications include "Experimental Surgery"; "Surgical Bacteriology"; "Intestinal Surgery"; "Pathology and Surgical Treatment of Tumors"; "Tuberculosis of Bones and Joints"; "Tuberculosis of the Genito-Urinary Organs"; "Medico-Surgical Aspects of the American-Spanish War"; etc. He died Jan. 2, 1908.

SENNA, in botany, various species of cassia. The leaf of *C. elongata* constitutes Tinnevelly senna. Other Indian species furnishing the drug are *C. Obovata*, *C. Lanceolata*, and *C. absus*. Alexandrian or Nubian senna is the leaf of *C. lanceolata* and *C. obovata*. It is often adulterated, accidentally or intentionally,

with the bladder senna (*Colutea arborescens*), as other kinds sometimes are with *Solenostemma argel*, which is bitter and irritating. Tripoli senna is from *C. æthiopica;* and that of Chile from *Myoschilos oblongus*. A confection, a compound mixture, a tincture, and a syrup of senna are employed in pharmacy.

SENNACHERIB, an Assyrian king, son of Sargon, whom he succeeded 705 B. C. He suppressed the revolt of Babylonia, and marched against the Aramæan tribes on the Tigris and Euphrates, of whom he took 200,000 captive. He then reduced part of Media; rendered tributary Tyre, Aradus, and other Phœnician cities; advanced on Philistia and Egypt, and finally proceeded against Hezekiah, King of Judah, who had revolted. Yielding to panic, Hezekiah paid the tribute exacted of 300 talents of silver and 30 talents of gold. On his return to Assyria Sennacherib again attacked Babylonia and afterward reinvaded Judah. Having marched through Palestine he besieged Libnah and Lachish, and wrote a threatening letter to Hezekiah; but in consequence of a miraculous visitation, which caused the death of 185,000 of his troops, Sennecherib returned to Nineveh and troubled Judah no more. His own account of this campaign has been discovered, and it acknowledges his failure. From Herodotus we learn an Egyptian tradition regarding the destruction of Sennacherib's host, but no mention of it is found in the monuments of Sennacherib. The greatest architectural work of Sennacherib was the palace of Koyunjik, which covered fully eight acres. He was murdered by his own sons, Adrammelech and Sharezer, 681 B. C.

SENSATION, the change in consciousness which results from the transmission of nervous impulses to the brain. Such impulses may be generated within the nerves themselves (but only in diseased conditions), or may be produced by stimuli applied to such parts of the body as are provided with nerves. Such nerves are often styled sensory or afferent. It must be remembered, however, that afferent impulses are constantly being carried to the brain from all parts of the body, resulting in motor and other acts necessary to our life, without exciting any sensation at all. It is through our sensations that we gain our knowledge of the external world, and of the state of our body. The means by which these are produced are the elaborate nervous mechanisms developed in connection with the various senses of smell, sight, hearing, taste, touch, temperature (or heat and cold), pain or general sensibility, the muscular sense, and those of hunger and thirst. For each special sense there is a particular nerve center (see BRAIN); and each special sense has its own peculiar end organ; the special endings of the olfactory nerves in the upper part of the septum of the nose for that of smell; the retina in the eyeball for sight; the rods of Corti in the cochlea for hearing; the taste bulbs and the fibrils in the fungiform papillæ in the tongue for taste; and the Pacinian corpuscles and the special ramifications of the cutaneous nerves in the epidermis for touch. The integrity of these and of the special non-nervous apparatus with which they are connected is necessary for the production of a sensation. Thus, the transparent media of the eyeball, and the rods and cones of the retina are all essential to the production of a visual sensation. In proportion as they are abnormal, the sensation is imperfect. Further, each end organ can be thrown into action only by certain kinds of stimuli, and the nerves in connection with them convey those impulses only which give rise to their own special varieties of sensation. The retina can only be stimulated by waves of light, never by those of sound, and the optic nerve if stimulated directly can give rise to visual sensations only.

The muscular sense is that by which we are made aware of the position of any part of the body, by which we gauge the amount of movement necessary to affect any object or to overcome any resistance. It would appear likely that the nerve endings connected with this sense are situated in the muscles, tendons, and joints, and that these are stimulated by changes in movement and mutual pressure in these structures.

The sensation of pain (or general sensibility) is produced when pressure on a part, or when the temperature of a body applied, exceeds certain limits. Painful sensations may result from excessive stimulation of a sensory nerve at any part of its course, which would seem to point in favor of the non-existence of special end organs. With regard to the paths by which these various impulses reach the brain, we know (if we except the fifth cranial and the vagus nerves) that they reach the spinal cord by the posterior roots of the spinal nerves, and that those impulses which produce tactile, thermal, and painful sensations for the most part (though this has recently been questioned) travel up the side of the cord opposite to that at which they entered, but their exact course is not certainly determined. The path for the muscular sense-impulses is by many regarded as lying in the posterior columns of the same side.

Within the medulla oblongata the ob-

security as to the upward sensory conducting tracts is even greater than in the cord, not only in the case of the senses above mentioned, but also of the sense of hearing and taste.

SENUSSI, MOHAMED IBN ALI EL, founder of the religious order which bears his name; born near Mostaganem, Algeria; died in 1851. He organized the secret brotherhood in 1837, with the object of purifying the Mohammedan religion. Eventually it spread all over the world of Islam and centers were established in Damascus, Constantinople and the big cities of India. He was succeeded as the head of the order by his son, Sidi el Mahdi, who died in 1902 and who was succeeded by the present head, Sidi Ahmed el Sherif.

SEOUL, the capital of Korea; about 3 miles N. of the Han river, 75 miles from its entrance into the Yellow Sea, and about 20 miles from its port Chemulpo, with which it has been connected by rail since July, 1900. It lies in a natural basin, among granite hill ranges, and is surrounded with walls. The streets are very narrow and very dirty, and the houses beggarly in the extreme. The city includes several wide, desolate squares. The royal palace and its adjuncts cover 600 acres of ground. Silk, paper, tobacco, mats, fans, and similar commodities are the principal products of native industry. There are schools for the teaching of Japanese, French, Chinese, Korean, Russian, and English, and an American Mission School, which is subsidized. There are also an electric light plant, an electric street railway, railways to Fusan and Wiju, and telegraph. Pop. including extensive suburbs, about 303,000.

SEPARATIST, a small sect calling themselves Separatists or Protestant Separatists, and holding aloof from the Church of England, believing it not sufficient to maintain its Protestant character.

SEPARATOR, the name commonly applied to machines which separate the component parts of emulsions or suspensions, especially to the apparatus used in the separation of cream from milk. All these machines work by centrifugal action. The simplest form consists of a number of buckets (usually two or four) suspended around a central shaft which can be caused to revolve at high speed by means of gears turned either by hand or by machinery. As the buckets revolve, they assume a horizontal position, the heavier portion of the mixture being forced to the bottom. Modern machines consist of a bowl or drum, frequently containing a number of conical plates. They are continuous in action. For instance, in the De Laval separator, commonly used in dairies for separating cream, a steady stream of milk is introduced into the machine, while a stream of skim milk flows from one point and a smaller stream of cream from another. These machines are highly efficient and, when properly used, leave less than one-tenth of a per cent of fat in the milk. Another type of centrifugal separator is largely used in the sugar industry. This type consists of a cylindrical basket which can be made to revolve at high speed. The sides of the basket are of fine wire screens or of cloth. Wet sugar is introduced into the basket and is flung, by centrifugal action, against the sides. The water is forced through the fine mesh, while the dry sugar is retained.

SEPIA, in zoölogy, the typical and only recent genus of *Sepiidæ;* body oblong (varying in length from 3 to 28 inches), with lateral fins as long as itself; arms with four rows of suckers; mantle supported by tubercles fitting into sockets on neck and funnel; shell broad and thick in front, laminated, and terminating in a permanent mucro. Woodward puts the species at 30, universally distributed. In palæontology; fossil species 10, from the Jurassic to the Eocene Tertiary. Several species have been based on mucrones from the London Clay. In comparative anatomy: the black secretion of the cuttlefish. In chemistry and art: a dark brown pigment prepared from the black secretion of the cuttlefish, *S. officinalis.*

SEPOY, a slight alteration of the ordinary word used for centuries by the natives of India for a soldier in general, but confined by Anglo-Indians to the Hindu and Mohammedan troops, especially to those in British pay.

SEPTARIA, ovate flattened nodules of argillaceous limestone or ironstone, internally divided into numerous angular fragments by reticulating fissures which radiate from the center to the circumference, and are filled with some mineral substance, as carbonate of lime or sulphate of barytes, that has been infiltrated subsequent to their formation. The radiating figure and the striking contrast between the dark body of argillaceous limestone or ironstone and the more or less transparent sparry veins when the nodule is cut and polished have caused them to be manufactured into small tables and similar objects.

Calcareous septarian nodules are extensively employed in the manufacture of what is known commercially as Roman

cement, because of its properties being the same as a famous hydraulic cement made of ferruginous volcanic ash brought from Rome. Such septaria occur in layers in clay deposits, and are quarried for economical purposes in the clays of the London basin.

The septarian nodules of the Carboniferous strata consist generally of clay ironstone, and are sometimes employed in the manufacture of iron.

SEPTEMBER (from the Latin *septem*, seven), the ninth month of our year, but the seventh of the old Roman year, which began in March. It has always contained 30 days.

SEPTEMBRISTS, in French history, the name given to the agents in the massacre which took place in Paris on Sept. 2, 1792, during the French Revolution.

SEPTICÆMIA, or **SEPTÆMIA**, in pathology, a state of the blood without secondary abscesses, a kind of pyæmia with intense fever, and great constitutional disturbance from blood poisoning. The antiseptic researches of Lister and of Pasteur have done much to counteract septicæmia.

SEPTUAGESIMA, the third Sunday before Lent, so called because it is about 70 days before Easter.

SEPTUAGINT, a Greek version of the Hebrew or Old Testament Scriptures, the oldest one made into any language. A still extant letter referred to by Josephus, Jerome, and Eusebius, purports to be from a certain Aristeas, officer at the court of Ptolemy Philadelphus. It states that after the king had founded the great Alexandrian library, he wished to have a copy of the Jewish sacred books. By the advice of his chief librarian, Demetrius Phalareus, he sent to the high priest at Jerusalem, requesting him to send six translators from each tribe, 72 in all. The request was complied with; the translators came and completed their work in 72 days. From their number, and perhaps the time they occupied, the name Septuagint arose. But the letter of Aristeas is not now believed to be genuine, and Coptic words in the work show that the translators were from Egypt, and not from Jerusalem. The version was apparently made at Alexandria, and was commenced about 280 B. C., the Pentateuch being the only part translated at first. It is well done. Next in value is the book of Proverbs. Job was translated from the Hebrew text, differing both by excess and defect from that now recognized. Esther, the Psalms, and the Prophets followed, seemingly between 180 and 170 B. C. Jeremiah is the best translated, and Daniel is executed so badly that Theodotian, in the 2d century A. D., had to do the work again. Jesus and His Apostles frequently quoted the Septuagint in place of the Hebrew. The Jews had a high opinion of the Septuagint, but on finding the Messianic passages used effectively by the Christians in controversy with them, they established a fast to mourn that the Septuagint had ever been issued, and had a new translation by Aquila brought out for the use of the synagogues. Three Christian recensions took place late in the 3rd or early in the 4th century. The first modern edition was the Complutensian in 1514-1517; since then others have appeared.

SEQUENCE, a series of things following in a certain order or succession; specifically, a set of cards immediately following each other in the same suit, as an ace, two, three and four. In music, the recurrence of a harmonic progression or melodic figure at a different pitch or in a different key to that in which it was first given. A tonal or diatonic sequence is when no modulation takes place. A chromatic or real sequence takes place when the recurrence of a phrase at an exact interval causes a change of key. In the Roman ritual, a rhythm sometimes sung between the Epistle and the Gospel. At first it was merely a prolongation of the last note of the Alleluia, but afterward appropriate words were substituted. When the Roman Missal was revised in the 16th century, only four of the existing sequences were retained: *Victinæ Paschali*, for Easter; *Veni, Sancte Spiritus*, for Pentecost; *Lauda, Sion*, for Corpus Christi; and the *Dies Iræ*, for Masses of the Dead. The *Stabat Mater*, for the Feast of the Seven Dolors, is of later date.

SEQUOIA, a genus of coniferous trees. It is closely allied to the cypress, and two species are noted, the big tree (*gigantea*) and the redwood (*sempervirens*). The big tree species is one of the largest in the world and is the largest in America. In California, where the two species are found, it rises to an average height of 275 feet. The largest exceed 320 feet, with a trunk diameter of from 30 to 35 feet. It is found on the west slopes of the Sierra Nevadas, at average elevations of 6,000 feet, appearing in scattered clusters. The Mariposa and Calaveras groves contain the highest trees. The tallest standing is the Keystone State, which is 325 feet in height, while another magnificent specimen is the Empire State, having a circumference of 94 feet. The Father of the Forest, a fallen specimen, has a

length of over 400 feet. These great trees are in the Calaveras grove. The Mariposa grove has about 500 trees of various sizes, of which about 100 are of the tall variety. A hunter named Dowd discovered the big trees in 1850. Some of the trees are supposed to be nearly 2,000 years old.

SEQUOIA NATIONAL PARK, a region made public property in 1890 in order to safeguard the splendid groves of sequoia trees which are there found. The number of groves in this park are twelve, and the number of large trees exceed 12,000, having a minimum diameter of 10 feet. The park was established by the acts of Sept. 25 and Oct. 1, 1890. The area includes 161,597 acres. The valleys, rivers, and forested slopes in this park combine to make up a picture of great beauty. Tourists in great number visit it each year, coming by way of Visalia, on the Southern Pacific and Atchison, Topeka and Santa Fé railroads, and then to Lemon Cove, going 40 miles by stage coach to the park. The trees belong to the Sequoia genus that showed themselves first in the cretaceous beds of Greenland and in the American Potomac group, as well as later in the Tertiary of Europe and America, resembling those still extant in California. They are collaterally related to the Swedenborgia of the Jurassic, which grew to great heights in earlier ages.

SERAJEVO, a city in Jugo-Slavia, formerly the capital of the Austrian province of Bosnia, situated on both banks of the Miljaka, 122 miles S. W. of Belgrade. The principal industries of the town consist of textile mills and metal ware factories. Iron mines and mineral springs are found in the vicinity. The name of the city, however, is generally associated with the assassination of the heir apparent to the throne of Austria-Hungary, the Archduke Francis Ferdinand, which took place there on June 28, 1914. Pop. (1919) 50,000.

SERAPIS, or **SARAPIS** (also found as OSARAPIS), the Greek name of an Egyptian deity, introduced into Egypt in the time of Ptolemy I. or Soter, and really a combination of the Greek Hades and Egyptian Osiris. He was not an Egyptian, but the Greek deity, with some Egyptian characters superadded; and his temple was not admitted into the precincts of Egyptian cities, finding favor only in the Greek cities founded in Egypt. It is said that 42 temples were erected under the Ptolemies and Romans to this god in Egypt. His resemblance to Osiris consisted in his chthonic or infernal character, as judge of the dead and ruler of Hades. The god had a magnificent temple, the famed Serapeum at Alexandria, to which was attached the celebrated library; another at Memphis, in the vicinity of the cemetery of the mummies of the Apis, which was excavated by Mariette in 1850; and another temple at Canopus. It appears that he represented or was identified with the Hesiri Api, or Osorapis, the "Osirified" or "dead Apis," who was also invested with many of the attributes of Osiris. The worship of Serapis, introduced into Egypt by the Ptolemies, subsequently became greatly extended in Asia Minor; and his image, in alliance with that of Isis and other deities, appears on many of the coins of the imperial days of Rome. In A. D. 146 the worship of the god was introduced into the city of Rome by Antoninus Pius; but it was not long after abolished by the senate, on account of its licentious character. A celebrated temple of Serapis also existed at Puteoli, near Naples, and the remains of it are still seen. In Egypt itself the worship of the deity subsisted till the fall of paganism, the image at Alexandria continuing to be worshiped till destroyed, A. D. 398, by Theophilus, archbishop of that city.

SERBIA (Jugoslavia), formerly an independent kingdom of eastern Europe; bounded N. by Austria-Hungary, from which it is separated by the Save and the Danube; E. by Bulgaria; W. by Albania and Montenegro; S. by Greece; area, 42,098 square miles; pop. about 5,000,000. Capital, Belgrade; pop. (1919) 120,000. The surface of Serbia is elevated and is traversed by ramifications of the Carpathians in the N. E., of the Balkans in the S. E., and of the Dinaric Alps in the W. The summits seldom exceed 3,000 feet, though the highest reaches 6,325. The whole surface belongs to the basin of the Danube, which receives the drainage partly directly, and partly by the frontier rivers Save, augmented by the Drin and the Timok, but chiefly by the Morava, which flows through the center of the kingdom. The climate is somewhat rigorous in the elevated districts, but mild in the valleys and plains. There are extensive forests and uncultivated wastes, the forest area being 42 per cent. of the total area.

Serbia is essentially an agricultural country, and each peasant cultivates his own freehold. These holdings range in size from 10 to 30 acres. Of the entire area of land, about 21 per cent. is under cultivation. The chief agricultural products are wheat, barley, oats, maize, rye and beetroot. Tobacco is also grown and the product in 1919 was 15.000 tons.

Silk culture is also carried on extensively, and before the World War about 35,000 persons were employed in this industry. The total production of wheat is about 25,000,000 cwt. annually. The mineral resources are considerable, although they have not been developed. They include coal, iron, copper, ore, gold and cement. In Idria are well-known quicksilver mines which produce about 130,000 tons yearly. The milling of flour is one of the most important industries, and before the World War there were 50 large flour mills in the country. Other industries are the brewing and distilling of liquors, weaving, tanning, boot making, carpet weaving, pottery and iron work. Statistics of commerce are not available for recent dates. Before the World War the imports were about £4,000,000 and the exports about £3,000,000 annually. There are about 1,000 miles of railway. The railway systems were practically destroyed during the war. The chief bank is the National Bank of the Kingdom of the Serbs, Croats and Slovenes, with a nominal capital of 50,000,000 dinars.

The State religion is the Serbian-Orthodox. There are also a large number of Roman Catholics, especially in the newly acquired territories.

Education is compulsory and, in primary schools, free. There are about 20 secondary schools and a number of theological, normal and special schools. Belgrade University, founded in 1838, had in 1920 7,250 students and 80 instructors. In the same year the University of the Serbs, Croats and Slovenes was established at Lioublina. The government has a military academy and 5 schools for non-commissioned officers.

The army was reorganized in 1916, following the invasion of Serbia. During the war over 750,000 men served in the armies, exclusive of 70,000 Jugo-Slav volunteers. The total losses in killed and missing amounted to about 370,000. The army was demobilized following the armistice of 1919, and was succeeded by the new army of Jugoslavia. Military service is compulsory and universal. The Serbian language, formerly often called the Illyrian, is a melodious Slavonic dialect closely allied to the Bulgarian and Slovenian, and forms with them the southern Slavonic group. Several collections of patriotic Serbian songs have been published, and both Goethe and Grimm have acknowledged the excellence of Serbian poetry. In prose literature, however, little has been produced besides theological and religious works. The present constitution of Serbia dates from 1903. The Slovenes, Croats, Dalmatians and Bosnians declared their independence in 1918, after the Austrian revolution. On Dec. 29, 1918, the kingdom of Serbs, Croats and Slovenes was formed, with Crown Prince Alexander as regent. The government was an hereditary monarchy, and the people were represented by an elected legislative assembly called the *skupshtina.*

History.—Serbia was anciently inhabited by Thracian tribes; subsequently it formed part of the Roman province of Mœsia. It was afterward occupied in succession by Huns, Ostrogoths, Lombards, Avares, and other tribes. The Serbians entered it in the 7th century, and were converted to Christianity in the next century. They acknowledged the supremacy of the Byzantine emperors, but latterly made themselves independent, and under Stephen Dushan (1331-1355) the kingdom of Serbia included all Macedonia, Albania, Thessaly, northern Greece, and Bulgaria. About 1374 a new dynasty ascended the throne in the person of Lazar I., who was captured by the Turks at the battle of Kossovo (in Albania) in 1389, and put to death. Serbia now became tributary to Turkey. About the middle of the 15th century it became a Turkish province, and so remained for nearly 200 years. By the peace of Passarowitz in 1718 Austria received the greater part of Serbia, with the capital, Belgrade. But by the peace of Belgrade in 1739 this territory was transferred to Turkey. The barbarity of the Turks led to several insurrections. Early in the 19th century Czerny George placed himself at the head of the malcontents, and, aided by Russia, succeeded after eight years of fighting in securing the independence of his country by the peace of Bucharest, May 28, 1812. The war was renewed in 1813, and the Turks prevailed. In 1815 all Serbia rose in arms under Milosh, and after a successful war obtained complete self-government, Milosh being elected hereditary prince of the land. Milosh was compelled to abdicate in 1839, and was nominally succeeded by his son Milan, who died immediately, leaving the throne vacant to his brother Michael. In 1842 this prince was compelled to follow the example of his father and quit the country. Alexander Kara-Georgevitch, son of Czerny George, was elected in his room; but in December, 1858, he also was forced to abdicate. Milosh was then recalled, but survived his restoration little more than a year. His son Michael succeeded him (1860), but was assassinated by the partisans of Prince Alexander July 10, 1868. The princely dignity was then conferred on Milan (Obrenovitch), grand-nephew of Milosh. After the fall of Plevna in the

Russo-Turkish War of 1877-1878 Serbia took up arms against Turkey, and obtained full recognition of its independence. It was erected into a kingdom in 1882. In 1889 Milan abdicated in favor of his son Prince Alexander, born Aug. 14, 1876, who became the ruler of the country as Alexander I.

Alexander married Countess Draga, who was unpopular with the people. On June 11, 1903, soldiers forced their way into the palace and bayoneted King Alexander, Queen Draga, and her two brothers. Prince Peter Karageorgevitch was then proclaimed King of Serbia, under the name Peter I. Following the accession of King Peter, the idea of a Greater Serbia, which had long been cherished by the Serbian people, became intensified. The hostile feeling toward Austria-Hungary was increased by the tariff policy adopted by the dual monarchy. Bitterness of feeling increased by Austria's annexation of Bosnia and Herzegovina in 1908. The Serbian Government retaliated by passing restrictive tariff measures and encouraged war-like preparations. Through the offices of Russia, however, the tension was relieved. In 1912 Serbia entered the Balkan alliance with Bulgaria, Greece and Montenegro and helped to precipitate the Balkan War (*q. v.*) of 1912 and 1913. As a result of the victory over Turkey in this war, Serbia nearly doubled her territory and increased her population by more than one-half. These gains were chiefly at the expense of Bulgaria and the dissatisfaction of that country led to the second Balkan War. Bitterness toward Austria was revived by the action of the latter in compelling the Serbs to surrender Durazzo and other territory to the newly created principality of Albania. This hatred of Austria came to a crisis when the Archduke Francis Ferdinand, heir to the Hapsburg throne, was assassinated on June 28, 1914, at Sarajevo, the capital of Bosnia, by a Serbian patriot. This act was the direct cause of the World War.

The first military operation in the war was the attempted invasion by Austria undertaken in the last days of July, 1914. This ended in disaster to the Austrian forces, as did a second attempt at invasion undertaken in September. The Serbian troops fought with great heroism and forced back the Austrians with great losses. The final invasion of Serbia was accomplished only by the combined force of Austrian, German, and Bulgarian troops and this was not undertaken until September, 1915. The Serbian Army was overwhelmed and was compelled to retreat, although it fought with the greatest bravery as long as there was a possibility of resistance. The army escaped, although with great losses, and Serbia was overrun by hostile armies. Over 700,000 civilians fled before the advancing armies of the enemy, and of these a large portion died during their flight. The Serbians reached Avlona or Durazzo and were taken to the island of Corfu, where after reorganization, they again took their place in the battle line and rendered most brilliant and effective service. For more detailed account of Serbia in the war, see WORLD WAR. The active command of the Serbian Army was in the hands of the Prince Regent. For the history of Serbia following the formation of the Jugoslavian State, see JUGO-SLAVIA.

SERENADE, music performed in the open air at night; often, an entertainment of music given in the night by a lover to his mistress under her window; or music performed as a mark of esteem and good-will toward distinguished persons. The name is also given to a piece of music characterized by the soft repose which is supposed to be in harmony with the stillness of night. The Italian name *Serenata* is now applied to a cantata having a pastoral subject, and to a work of large proportions, in the form to some extent of a symphony.

SERES, a town of Greece, in the former vilayet of Saloniki; on a tributary of the Struma or Karassu; 45 miles N. E. of Saloniki; lies in a wide and fertile plain containing upward of 300 villages; is the seat of a Greek archbishop; and is the most important trading town in the interior of Macedonia. It has a castle, numerous mosques, Greek churches, baths, benevolent institutions, manufactures woolen and cotton goods, gourd-shaped water flasks, and exports cotton, rice, tobacco, and grain.

SERETH, an important affluent of the Danube. It rises in the Carpathians in Bukowina, flows through Rumania, and joins the Danube 5 miles above Galatz after a course of 300 miles. Parts of the regions through which it flows saw much fighting between the Russian and Austro-German armies during the World War.

SERFS, a term applied to a class of laborers existing under the feudal system, and whose condition, though not exactly that of slaves, was little removed from it. Under this system, from the vassals of the king downward, the whole community was subject to certain degrees of servitude, and it was only on condition of specific services to be rendered to his superior that any individual held his fief. In the case of the lower classes this servitude amounted to an al-

most complete surrender of their personal liberty. There were two classes of laborers, the villeins and the serfs proper. The former occupied a middle position between the serfs and the freemen. A serf could not be sold, but could be transferred along with the property to which he was attached. The revival of the custom of manumission counteracted the rapid increase of serfs. A serf could also obtain his freedom by purchase, or by residing for a year and a day in a borough, or by military service. By these various means the serf population gradually decreased. In most parts of the Continent they had disappeared by the 15th century. The extinction of serfdom in England and Scotland was very gradual. Serfdom in Russia was abolished by a manifesto of Alexander II. on March 17, 1861.

SERGEANT, THOMAS, an American jurist; born in Philadelphia, Pa., Jan. 14, 1782; was graduated at Princeton College in 1798, and admitted to the bar in 1802. He was made associate justice of the Philadelphia District Court in 1814; was Secretary of State in 1817-1819, and associate justice of the Pennsylvania Supreme Court in 1834-1846. He resumed practice in 1847. He was the author of a "Treatise upon the Law of Pennsylvania Relative to the Proceedings of Foreign Attachment" (1811); "Reports of Cases adjudged in the Supreme Court of Pennsylvania" (with William Rawle, Jr., 17 vols., 1814-1829); "Sketch of the National Judiciary Powers exercised in the United States Prior to the Adoption of the Present Federal Constitution" (1838); etc. He died in Philadelphia, Pa., May 8, 1860.

SERGEANT, or **SERJEANT,** a sheriff's officer, a bailiff; a title given to certain officers of the British sovereign's household, serjeant; a police officer of superior rank to a private. Sergeant-at-arms, an officer appointed by a legislative body, whose duties are to enforce the orders given by such bodies, generally under the warrant of its presiding officer. In military language, the second permanent grade in the non-commissioned ranks of the army. In the United States service there are regimental as well as company sergeants. Their duties are mainly indicated by the title, which is a compound of sergeant with the superior officer or the department they are intended to serve; as, sergeant-major, quartermaster-sergeant, color-sergeant, commissary-sergeant, ordnance-sergeant.

SERGINSK, Upper and Lower, industrial settlements in the government of Perm, east Russia. Both were founded by Demidoff in the middle of the eighteenth century and are situated 43 miles S. W. of Ekaterinburg. There are large iron ore mines in the vicinity and these with the iron works, give occupation to most of the inhabitants. Annual production of iron and steel quoted at 20,000 tons. Pop. (Upper Serginsk) about 17,000; (Lower Serginsk) about 14,000.

SERGIUS, the name of several popes.

SERGIUS I.; born in Syria, about 630, succeeded Conova in 687. He opposed the canons of the Council of Constantinople, whereupon Justinian II. sent his general-in-chief to arrest Sergius; but the exarch of Ravenna protected the Pope, who humanely interposed to save the life of Justinian's envoy. He instituted several ceremonies and established various churches at Rome. He died in Rome in 701.

SERGIUS II., was a native of Rome, and succeeded Gregory IV. in 844. He was elected without the authorization of the Emperor Lothaire, who dispatched an army into Italy, under the command of his son Louis. But the Pope succeeded in inducing that prince to retire, after having crowned him King of Italy. Shortly afterward, the Saracens from Africa ascended the Tiber, and ravaged the environs of Rome, but were unable to enter the city. He died in 847.

SERGIUS III., became Pope in 904, through the influence of the Marquis of Tuscany and of the notorious Roman lady, Marozia. These personages were at the head of a powerful party which had deposed Christopher. A son of Sergius, by Marozia, afterward became Pope by the title of John X. The character of this pontiff has been variously represented. He died in 911.

SERGIUS IV. was elected Pope in succession to John XVIII., in 1009. Under his rule, and in consequence of his exhortation, the Italian princes combined to drive out the Saracens from the country. In his time, also, the Normans began to enter Italy. He died in 1012.

SERIEMA (*Dichlophus cristatus*), a grallatorial bird of the size of a heron inhabiting the open grassy plains of Brazil and other parts of South America. Its feathers are of a gray color, and a kind of crest rises from the root of the beak, consisting of two rows of fine feathers curving backward. The eye is sulphur-yellow, the beak and feet red. The seriema is protected in Brazil on account of its serpent-killing habits and is often domesticated.

SERIES, a continued or connected succession of things in the same order, and bearing the same relation to each

other; a sequence. In mathematics, a number of arithmetical or algebraic terms in succession, increasing or diminishing according to a certain law. Series derive their names from the laws which govern the formation of their respective terms. Thus, an arithmetical series is one whose consecutive terms have a common difference; a harmonic series one of which every three successive terms are in a harmonic proportion. A geometric series is one every term of which has a constant ratio to the preceding one; it belongs to the family of recurring series, in which each term is a constant function of one or more preceding terms.

In botany, a row or layer; in botanical classification, a grade intermediate between a class and an order. In chemistry, a group of compounds, each containing the same radical. Thus the hydrocarbon, CH_4, methane, may take up any number of the molecules of the radical CH_2, thereby giving rise to the series C_2H_6, ethane, C_3H_8, propane, C_4H_{10}, quartane, etc. In geology a term for subdivisions of sedimentary strata.

SERINGAPATAM (properly, Sriranga-pa-tana, "city of Vishnu"), a celebrated town and fortress in the province of Mysore, Madras presidency, India. It is on an island formed by two branches of the Kaveri, 245 miles S. W. of Madras, and is generally ill-built, with narrow, dirty streets. It was once the capital of Mysore. The palace, formerly extensive, is now in ruins. Other notable public buildings are the great mosque, and the pagoda of Sri Ranga, the arsenal and the cannon foundry. The massive fortifications were the work of Tippoo, the son of Hyder Ali, assisted by French engineers, and the fortress was three times besieged by the British, first in 1791, and afterward in 1792 and 1799. On the last occasion it was carried by assault, Tippoo himself being slain while fighting desperately, together with 8,000 men. Pop. about 12,500.

SEROUS FLUIDS, a name given to the lymph-like pellucid fluids secreted by certain membranes and contained in certain cavities of the body. An excess of this secretion constitutes a diseased and often a dropsical condition.

SEROUS MEMBRANE, in anatomy, a membrane having its surface moistened by serum. They line the cavities of the body from which there is no outlet. The chief are the peritoneum, the two pleuræ, the pericardium, and the arachnoid membrane. Serous membranes differ from mucous membranes in having thinner layers, finer fiber, and an epithelium with only a single layer of polygonal cells.

SERPENT, in zoölogy, the *ophidia*, an order of reptiles popularly distinguished from the rest of the class by having a very elongated body and no external limbs. They are very widely distributed, abounding in the tropics, where they attain their greatest size, absent only from the Arctic and Antarctic regions, and they are mentioned in the earliest records of the human race. The length of the body is a marked feature. The number of vertebræ varies greatly, more than 400 occurring in some of the great pythons. No sacrum exists, and there is no distinction between or divisions of the spine into cervical, dorsal, and lumbar vertebræ. A notable feature is the large number of ribs; almost all the vertebræ, with the exception of the atlas or first, bearing these. The ribs articulate with the transverse processes of the vertebræ, and are not attached inferiorly to any breastbone, but are imbedded in cartilages which are in turn connected with the great scales or scuta that cover the ventral surface of the body. The premaxillæ are represented usually by a single small bone, which rarely has teeth, and is joined to the maxillæ by fibrous tissue only. The floor of the skull is flat, while in front it diminishes greatly in height. The hyoid is very rudimentary, and is represented by two cartilaginous filaments, unconnected in any way with the skull. In the pythons a pair of rudimentary hind limbs exists, and traces of a pelvis are also found.

Locomotion is effected by the muscular contractions of the body, the animals moving literally on the ends of their ribs. Teeth are borne by the premaxillary bones, by the maxillaries, palatine, and pterygoid bones, and by the dentary part of the mandible. One of the most singular developments of teeth in serpents and indeed in the entire animal kingdom, occurs in a little African snake—*Rachiodon*. In this snake, the ordinary teeth are very small, but the lower or inferior spines of some eight or nine vertebræ of the neck are long, and their enameled tips project into the interior of the gullet, so that when the snake swallows an egg, the brittle morsel passes entire into the gullet, and is broken only when fairly on its way into the stomach. The teeth of serpents are not implanted in sockets, but become ossified to the surfaces of the bones which bear them. They are replaced when worn away or injured by new teeth developed at the bases of the former ones. In the typically poisonous serpent (*e. g.*, the rattlesnake) the upper jaw bears two largely developed teeth termed fangs. Each fang has a very deep groove running down its anterior aspect, and the margins of this groove

are opposed so as to convert it into a canal—hence the fangs are said to be canaliculated. This canal opens by a wide aperture above into the poison gland, so that by the compression, muscular and friable, of the gland, the poison flows down the canal and is ejected, through the lower minute aperture, into the wound made by the fang.

The poison of different serpents varies in intensity and virulence, but appears to take effect on the blood. The most effective treatment for snake-bite is to tie a ligature tightly round the limb, above the wound, and to excise the part freely, and then to suck the blood repeatedly, and cauterize the parts deeply before removing the ligature. In sucking a poisoned wound, the danger consists in there being a crack or wound in the mouth by which the poison may be absorbed.

The digestive system of serpents presents nothing worthy of special remark, save that the intestine ends in a cloaca opening transversely. There is no urinary bladder, and the heart (as in all reptiles save the *Crocodilia*) is three-chambered.

Serpents are divided into three groups: innocuous, venomous colubrine, and viperine, the last two groups possessing poison fangs, the boas, which kill their prey by constriction, belonging to the first. Broadly speaking, the innocuous serpents are oviparous, the venomous are ovoviviparous. Most of the former deposit the eggs in a long string in some heap of decaying vegetable matter, and leave them; while some of the larger serpents coil round their eggs, and hatch them by the heat of their bodies. Some of the innocuous kinds are capable of being tamed; the rat snake (*Ptyas mucosus*) is often kept in houses in India for the purpose of destroying rats and mice.

SERPENTINE, an abundant mineral occurring in one or other of its numerous varieties in all parts of the world. Crystallization, probably orthorhombic, but when found in distinct crystals always pseudo-morphous. Occurs usually massive, but sometimes fibrous, foliated, fine granular to cryptocrystalline. Color shows many shades of green, yellow; streak, white, shining; translucent to opaque; feel, greasy; fracture, either conchoidal or splintery. Composition: Silica, 44.14; magnesia, 42.97; water, 12.89= 100, corresponding with the usually-accepted formula, $2MgOSiO_2+MgO,2HO$.

In petrology, a rock, consisting essentially of a hydrated silicate of magnesia, resulting from the alteration of magnesian rocks, of all geological ages, especially those of olivine. It contains also some protoxide of iron, and other impurities which cause a great variation in color, which is often of a dull green, but is also marbled and mottled with red and purple. It takes a high polish, and is turned into ornamental articles. The accessory minerals are numerous, the most frequent being pyrope, bronzite, magnetite, and chromite. In geology, serpentine is considered an altered intrusive rock, originally a trap or dolerite with olivine.

SERPUKOFF, an ancient Russian town, 57 miles by rail S. of Moscow, on the Nara, 3 miles from its confluence with the Oka. It contains a cathedral (1380), and was before the World War, a place of considerable commercial and industrial importance, manufacturing chiefly cottons, woolens, leather, paper, furniture, and earthenware. Pop. about 31,000. It was formerly a fortress protecting Moscow on the S.

SERPULA, a genus and family of *Annelidæ*, whose organs of respiration are in tufts attached to the head and anterior part of the body. In most cases, they live in tubes, and hence are often called tubicolæ. In some the tubes are calcareous, in others horny, the result of transudation; others, still, are formed of grains of sand, or other particles, bound together by a membrane, also transuded. The genus serpula has the anterior portion spread out in the form of a disk armed on each side with bundles of coarse hairs, and on each side of the mouth is a tuft of branchiæ, shaped like a fan, and generally tinged with bright colors. At the base of each tuft is a fleshy filament, one of which is ever elongated, and expanded at its extremity into a disk, which serves as an operculum, and seals up the opening to the tube, when the animal is withdrawn into it. The calcareous tubes of the *Serpulæ* cover submarine bodies.

SERRA DA ESTRELLA, a lofty range of granite mountains near the middle of Portugal, highest summit 6,460 feet. The range contains some remarkable lakes, part of which are tepid.

SERRANUS, sea perches; a genus of *Percoidæ;* found on the shores of all temperate seas, and abound in the tropics, some of the latter species entering brackish and even fresh water, but all spawn in the sea. Body oblong, compressed, with small scales; teeth villiform, with distinct canines in each jaw, teeth on vomer and palatine bones; one dorsal, mostly with 9 or 11 spines, anal with 3. Two species, *S. cabrilla*, the smooth serranus, and *S. gigas*, the dusky perch, are met with in the British Channel, and are common in the Mediterranean.

SERTORIUS QUINTUS, a Roman general; a native of Nursia, in the country of the Sabines. He served under Marius in the Cimbric War, afterward in Spain, and was made quæstor 91 B. C. He joined the party of Marius in the Civil War, and commanded the Cinna at the siege of Rome 87 B. C. The license and cruelty of the slaves led him to slay several thousand. Appointed prætor in 83, he went soon after to Spain, but was forced to retire before the forces of Sulla, and went to Africa; but on the invitation of the Lusitanians, returned and put himself at their head to fight for independence. He made himself master of the greater part of Spain, established a senate, founded a school at Osca for the education of young Spaniards in Greek and Roman learning, and to increase the superstitious reverence of the people for his person, gave out that he had communications with the gods through the white fawn which always accompanied him. Metellus Pius was sent against him in 79, but could effect nothing; two years later Pompey joined Metellus, but Sertorius, reinforced by Perperna, held out against both till 72. He entered into negotiations with Mithridates, which caused fresh alarm at Rome. But his influence and popularity were shaken by his despotic acts, and especially by the massacre of all the scholars at Osca; and he was assassinated by Perperna, his ally, at a banquet 72 B. C.

SERUM, in anatomy, a pale yellowish liquid obtained by drawing blood from the vessels and allowing it to separate into a thicker and a thinner portion. The thinner one is the serum. It consists of proteid substances, fats, extractives, and saline matter. The solid contents of the serum is 9.22 in males, and 8.29 in females; the rest is water. There is also a serum of chyle and one of lymph. In chemistry, the opalescent liquid, containing milk-sugar and various salts, which separates when milk is curdled by the action of acids, rennet, etc.

SERUM THERAPY, the practice of treating diseases by injecting into the blood, fluid obtained from animals previously rendered immune against these diseases. This system of treatment is based upon the theory that bacteria produce disease by the formation in the blood, of poisonous bodies known as toxins. The blood of a healthy animal has the power of combating the effect of these toxins by the production of other bodies known as antitoxins. These antitoxins not only check the course of the disease, but to a large extent render the person who has suffered from any particular disease immune against subsequent attacks. The object of serum therapy is to produce an artificial resistance to disease by introducing into the blood antitoxins from an outside source.

The most successful application of the theory has been in the treatment of diphtheria, and a description of the method of preparing the serum used in this disease may be taken as an example. A culture of the bacillus which causes diphtheria is made in broth, and the toxin is thereby produced. The bacilli are then killed by a weak antiseptic solution and removed by filtration. The filtrate contains the toxins in solution, and small doses are injected into the blood of a healthy horse. More and more doses are injected at intervals, in ever-increasing quantities. The blood of the horse combats the poison by producing antitoxins, and the serum is tested, from time to time, by injecting into guinea-pigs, previously inoculated with diphtheria bacilli. When the serum has reached the required strength, the horse is bled, the serum is separated from the blood, treated with a preservative and measured into standard doses. By introducing this serum into the blood of persons suffering from diphtheria the resistance to the disease is greatly increased.

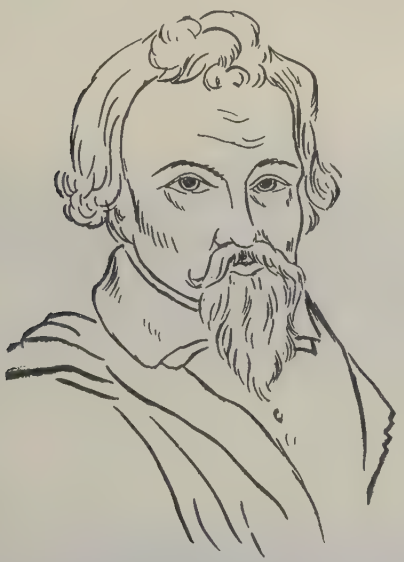
Several attempts to cure other diseases by the use of serums have met with failure. For instance, serums for the treatment of pneumonia, scarlet fever, rheumatism, dysentery, cholera, and anthrax have met with little or no success. On the other hand, tetanus, meningitis, plague and snake poisons have all been successfully treated by this method. An antitoxin for the cure of hay fever has been used with partial success. It is prepared from animals which have become immune against the effect of pollen from plants or grasses. It is found, however, that there are so many varieties of pollen that no animal can be immune against all of them. In consequence, the serums are frequently found useless owing to the fact that the sufferer from the disease may come into contact with pollen different from that encountered by the animal from which the serum was prepared.

Another use of serum is in the control of persistent bleeding, the normal serum of the horse being found valuable for this purpose. Convalescent serums, prepared from the blood of convalescents from various fevers, are also used.

SERVAL, the *Felis serval*, the bush cat, or African tiger-cat, distributed over Africa, abounding in the S. Its body is proportionately longer, and its tail shorter than those of the true cats, in this respect approaching the lynxes, from which it is differentiated by the absence of ear

tufts. Body about 40 inches, tail 16 inches, fur tawny, spotted with black. It is found in the extensive grassy plains, where it preys on antelopes and other small game.

SERVETUS, MICHAEL (properly MIGUEL SERVEDE), a learned Spaniard, memorable as a victim of religious intolerance; born in Villa Nueva, Arragon, Spain, in 1511; was the son of a notary, who sent him to Toulouse to study civil law. Here he began to give his attention to theology, and having formed views of the Trinity antagonistic to the orthodox doctrine he removed to Germany, where



MICHAEL SERVETUS

he printed a tract entitled "On the Errors of the Trinity" (1531), followed a year later by his "Dialogues on the Trinity." Finding that his opinions were obnoxious to Germany, he escaped to France under the name of Michael of Villa Nueva. He graduated as a doctor of medicine in Paris and here met Calvin. An arrangement was made for a theological discussion between them; but Servetus failed to appear. In 1538 he quarrelled with the medical faculty at Paris, and proceeded to Charlieu, near Lyons, where he practiced three years, subsequently moving to Vienne. Here, in 1553, he published "Restoration of Christianity." He was arrested for heresy and imprisoned, but contrived to escape. He was, however, apprehended at Geneva on a charge of blasphemy and heresy. The divines of all the Protestant Swiss cantons unanimously declared for his punishment, and Calvin was especially urgent and emphatic as to the necessity of putting him to death. As he refused to retract his opinions he was burnt at the stake in Geneva, Switzerland, Oct. 27, 1553. Servetus is numbered among the anatomists who made the nearest approach to the doctrine of the circulation of the blood.

SERVICE, ROBERT WILLIAM, a Canadian author, born at Preston, England, in 1874. He was educated at Hillhead Public School, Glasgow, and served apprenticeship with the Commercial Bank of Scotland, Glasgow. Later he emigrated to Canada and settled on Vancouver Island He engaged in farming and traveled up and down the Pacific coast experiencing many vicissitudes and following many occupations. In 1905 he joined the Canadian Bank of Commerce in Victoria, B. C., and then went to Yukon Territory and Dawson, traveling in sub-arctic regions. Later he started relating his experiences. His works include: "Songs of a Sourdough"; "Ballads of a Cheechako"; "Trail of '98"; "Rhymes of a Rolling Stone"; "The Pretender"; "Rhymes of a Red Cross Man."

SERVICE MEDALS and DECORATIONS. The most important decorations and service medals issued to those who served in the army of the United States, are the following: Civil War Campaign Medal, Indian Campaign Medal, Spanish Campaign Medal, Philippines Campaign Medal, China Campaign Medal, Cuban Occupation Medal, Cuban Pacification Medal, Mexican Service Medal, Philippines Congressional Medal, Spanish War Service Medal.

For service in the World War there was designed the Victory Medal, which was issued free to officers, surgeons, field clerks, army nurses, and enlisted men who served on active duty in the army of the United States at any time between April 6, 1917, and November 11, 1918, and whose service was honorable; also to all persons who entered the service subsequent to Nov. 11, 1918, and served as a member of the American Expeditionary Force in Siberia or European Russia, and whose service was honorable. A Victory Button was also issued to those who served in the World War. This is for wear on civilian clothing only. It is of silver for those who were wounded in action, and of bronze for all others.

The Congressional Medal of Honor, the Distinguished Service Cross, and the Distinguished Service Medal are awarded for special service. The Medal of Honor is awarded to those who, while officers or enlisted men of the army, conspicuously distinguished themselves in action involving actual conflict with an enemy, by

gallantry and intrepidity at the risk of life, above and beyond the call of duty. The Distinguished Service Cross is awarded to persons who have distinguished themselves by extraordinary heroism in connection with military operations against an armed enemy. The Distinguished Service Medal is awarded to those who distinguished themselves by exceptionally meritorious service with the Government in a duty of great responsibility.

Not more than one Medal of Honor, Distinguished Service Cross, or Distinguished Service Medal may be issued to any one person, but for each succeeding act sufficient to justify the award of any of these, a bar or other device is worn, and for each citation of an officer or enlisted man for gallantry in action, he is entitled to wear a silver star with the medal, service cross, or service medal.

The total number of Congressional Medals of Honor awarded during the World War was 78. Awards were made of 1,292 Distinguished Service Medals, and of Distinguished Service Crosses, 5,709. Of the latter, 5,200 were awarded by the Commanding General of the Expeditionary Forces, 487 by the War Department, and 22 by the Commanding General of the American Forces in Siberia. These totals include the awards up to December 20, 1920.

The medals awarded for distinguished service in the navy include three, the Medal of Honor, the Distinguished Service Medal, and the Navy Cross. The medal known as the Victory Medal, together with an appropriate clasp, is issued to any person who performed honorable duty in the navy or naval reserves, between April 6, 1917, and Nov. 11, 1918. This is equivalent to the Victory Medal noted above. The Medal of Honor is awarded to those who distinguished themselves by gallantry and intrepidity at the risk of life, above and beyond the call of duty. The Distinguished Service Medal is bestowed for exceptionally meritorious service to the Government, in a duty of great responsibility. The Navy Cross is awarded for extraordinary heroism or distinguished service in the line of professional duty, when such service is not sufficient to justify the award of the Medal of Honor or the Distinguished Service Medal.

SERVICE TREE, the *Pyrus sorbus* or *domestica,* a native of Continental Europe and western Asia. It has serrate leaves, unequally pinnate, and cream-colored flowers. It is from 20 to 60 feet high. Two varieties, the pear-shaped, *P. S. pyriformis,* and the apple-shaped, *P. S. maliformis,* are cultivated in parts of France and near Genoa for their fruit. Also *Pyrus* (*sorbus*) *torminalis,* the wild service tree. It is a small tree growing in woods and hedges, but rare and local. Flowers numerous, white, appearing in April and May. The fruit pyriform or sub-globose, greenish-brown, dotted. It is eatable, and is sold in parts of Europe.

SERVISS, GARRETT PUTMAN, an American writer, born at Sharon Springs, N. Y., in 1851. He graduated from Cornell University in 1872 and from the Columbia School of Law in 1874. Until 1892 he was an editorial writer on the New York "Sun," and from that time lectured on travel, history and astronomy. His books include "Astronomy with an Opera Glass" (1888); "Pleasures of the Telescope" (1901); "Other Worlds" (1902); "Astronomy with the Naked Eye" (1908); "Round the Year with the Stars" (1910); "The Moon Maiden," a story, (1915).

SERVITES, the name commonly given to a monastic order, the Religious Servants of the Holy Virgin, founded in 1233 by seven Florentine merchants at Mount Senario, near Florence. St. Philip Benoit, the fifth general, saved the order from suppression in 1276, and in 1487 Pope Innocent VIII. bestowed on the Servites the privileges of the four great mendicant orders. The life is one of austerity and continual prayer; the habit is black, with a leather girdle, a scapular, and a cloak, and the rule is a modification of that of St. Augustine. The strength of the order lay chiefly in Italy and Germany. Since the French Revolution many houses have been founded in different countries. There are several houses of the order in the United States.

SERVITUDE, a state or condition of a serf, slave, or bondman; state of voluntary or involuntary subjection to a master or employer; service; slavery; bondage; position in life of a servant;—hence, a state or condition of slavish or helpless dependence. In civil law, the right to the use of a thing, without property in the same, for all or for some particular purposes. It consists either in the right to do some act, as to gather fruit from the estate, or to prevent the owner of the property from doing certain acts, as building walls beyond a certain height, blocking up a window, etc.

SERVIUS TULLIUS, the 6th king of Rome. According to the tradition he was the son of a slave given by the elder Tarquin to Tanaquil, his wife. He married Tarquin's daughter, and on the death of his father-in-law (578 B. C. according to the usual chronology) he was raised to the throne. He defeated the Veientines

and the Etruscans, and divided the population of Rome into tribes, instituting at the same time the *comitia centuriata* and *tributa;* he also beautified the city, and built several temples. According to the common story Servius married his two daughters to the grandsons of his father-in-law; the elder to Tarquin, and the younger to Aruns. The wife of Aruns murdered her own husband to unite herself to Tarquin, who had assassinated his wife. Servius was murdered by Tarquin, and his own daughter Tullia ordered her chariot to be driven over the mangled body of her father (534 B. C.).

SESAME, an annual herbaceous plant of the genus *Sesamum*, natural order *Bignoniaceæ*, sub-order *Pedaliaceæ* a sub-order characterized by wingless seeds, and placentæ with woody lobes attached to the inner wall of the fruit. The species most noteworthy of notice is *S. indicum*, sometimes identified with and sometimes distinguished from *S. orientale*, a native of India. Sesame is cultivated throughout the East from Egypt to Japan for the sake of the seeds, which yield by expression gingili oil. The oil is used in cookery—as a substitute for butter in the same way as olive oil—for lighting, and for the purposes of lubrication. It is inodorous, has a sweet taste, and keeps for years without becoming rancid. In Egypt and Arabia it is preferred to olive oil. It is used in connection with medicine. Egyptian women consider it the best of cosmetics. The oil cake, mixed with honey and preserved citron, is an Oriental luxury. The leaves of sesame abound in a gummy substance, which they readily impart to water, making a rich bland mucilage, which is used in the S. parts of the United States (where it is grown a little) as a demulcent drink. Sesame is sometimes called til seed.

SESAMOID BONES, the name given to certain rounded bodies, at first cartilaginous and then bony, found in the tendons of muscles. The patella or knee cap is a sesamoid bone. Another is developed in the upper joint of the thumb, and at the corresponding joint of the great toe. These bones are said to occur most frequently in males, and in persons of robust and muscular build.

SESHA, in Hindu mythology, the king of the serpent race, on which Vishnu reclines on the primeval waters. It has 1,000 heads, on one of which the world rests. The coiled-up Sesha is the emblem of eternity.

SESOSTRIS, the most celebrated of the early kings of Egypt. According to the legend, which evidently confounds the military exploits of several monarchs, he, on succeeding to the throne, became ambitious of military fame, and marched at the head of a numerous army to make the conquest of the world. Libya, Æthiopia, Arabia, with all the islands of the Red Sea, were conquered; and the victorious monarch marched through Asia, and penetrated farther into the East than the conqueror of Darius. He also invaded Europe, defeated the Thracians, and placed columns in the several provinces he had subdued, bearing the pompous inscription, "Sesostris, the king of kings, has conquered this territory by his arms." After his return, he employed himself in encouraging the fine arts, and in improving the revenues of his kingdom. In his old age, Sesostris, having grown infirm and blind, destroyed himself. The time of Sesostris is placed from 1400 to 1250 B. C. Sesostris, so called by the Greeks, is identical with Rameses II., one of the most famous of the Pharaohs.

SESSA (the ancient Suessa Aurunca), a town of southern Italy in the province of Caserta; on the crater of an extinct volcano, and on the road from Gaeta to Capua; 16 miles N. W. of the latter. It contains the ruins of an amphitheater, and ancient medals and bronzes have been found.

SESSION, the sitting together of a body of individuals for the transaction of business; the sitting of a court, council, legislature, academic body, or the like, or the actual assembly of the members of such or like bodies for the transaction of business. Also the time, space or term during which a court, council, legislature, or the like meets for business, or transacts business regularly without breaking up or dissolving. The session of a judicial court is called a term. Sessions is used as the title of some courts of criminal jurisdiction in the United States and England.

SESTERCE, a Roman coin, the fourth part of the *Denarius*, and thus containing at first two *asses* or *libræ*. The name is an abbreviation of the Latin *semis-tertius*, which was their mode of expressing two, and their custom was to derive the names of all their coins from the foundation of their money system, the *As*. The symbols for it were indifferently HS or IIS, the former being only a modification of the latter, which expresses two units, and S for the additional half-unit (*semis*). In the Latin classics, the phrase *sestertius-nummus*, or merely *nummus*, is frequently employed to denote this coin. When the *Denarius* was made to contain 16 *asses*, the relation between it and the sestertius was preserved and the latter from that time contained 4 *asses*, though

the name, which was now no longer significant, was preserved. The sum of 1,000 sestertii was called *sestertium*, which, after Augustus, was equal to about $43, and was the "money of account" (never a "coin") used in the reckoning of large sums of money.

SETHITES, a Gnostic sect that existed in Egypt in the 2d century and bore some resemblance to that of the Ophites. They worshiped Seth, the son of Adam, as the son of God, but not of the creator of Adam and Eve, and maintained that he had reappeared in the person of Jesus Christ. They pretended to have several books written by him.

SETHOS I., or SETI, an Egyptian monarch, the second Pharaoh of the XIX. dynasty; which lasted from 1326 B. C. to 1203 B. C. He seems to have been one of the shepherd race in the E. part of Delta. He was distinguished as a builder and a warrior, erecting the temples of Osiris at Abydos, the "hall of columns" in his palace at Karnak, and establishing the power of Egypt over western Asia. He reigned about 30 years.

SETON, ERNEST THOMPSON. See THOMPSON-SETON.

SETON, ROBERT, an American Roman Catholic archbishop, born in Pisa, Italy, in 1839. He graduated from the Ecclesiastical Academy of Rome, in 1867, having been appointed the year previous private chamberlain to Pope Pius IX. From 1876 he was rector of St. Joseph's Church, Jersey City. In 1903 he was appointed archbishop of Heliopolis. He was lecturer at the Catholic University of Washington, and at Seton Hall College. He wrote "Memoir, Letters and Journal of Elizabeth Seton" (1869); "Roman Essays" (1882); and "An Old Family" (1899).

SETON HALL COLLEGE, a Roman Catholic institution for higher education, at South Orange, N. J. It was founded at Madison, N. J., in 1856, and was removed to South Orange in 1860. There were, in 1919, 21 instructors and 321 students. President, J. F. Mooney.

SETTER, a breed of dog employed in shooting, where he fills the same vocation as the pointer. The setter is divided into three varieties—the English setter, the Gordon setter, which is native to Scotland, and the Irish setter. There was also at one time a variety known as the Welsh setter, but it is now extinct. As early as the 16th century the then Duke of Northumberland owned a dog trained by himself to set game, an idea soon followed by others. For many years, however, the spaniel or any other suitable dog was selected to train to the habit of setting game; and it is not till the beginning of the 19th century that any reliable record of a distinct breed of setting dogs can be found. The English setter is bred from the spaniel probably by crossing with the pointer. Though at one time setters were known of nearly all colors, at the present time the English setter is generally white with red markings, or ticked with black spots known as a "blue Belton." The Gordon setter was founded by the Duke of Gordon about 1800, by crossing the existing setter with a collie bitch which had been trained to set. The Gordon was originally a black, tan, and white dog, though white has gradually disappeared from the breed. The Gordon setter should now be a rich and glossy black marked with tan on face, chest, and legs. The origin of the Irish setter is unknown.

SETTLEMENT, in ecclesiology, a sum of money or other property granted to a clergyman on his ordination, exclusive of his salary; or, a homestead of a pastor, as furnished sometimes by donation of land with or without buildings, sometimes by the pastor's applying funds granted for the purpose. In law, the act of settling property upon a person or persons: a deed by which property is settled; the general will or disposition by which a person regulates the disposal of his property, usually through the medium of trustees, and for the benefit of a wife, children, or other relatives; disposition of property at marriage in favor of a wife; jointure.

SETTLEMENT, ACT OF, in English history, an act passed in 1702, by which the succession of the crown was settled on the death of Queen Anne on Sophia, granddaughter of James I., and wife of the Elector of Hanover, and the heirs of her body, being Protestants.

SETUBAL, or ST. UBES, a seaport of Portugal; on the N. side of the Bay of Setubal; 17 miles S. E. of Lisbon. The harbor is protected by five forts. The town owes its importance chiefly to its trade in wine, sea-salt, and oranges, though fishing is carried on with considerable activity. Setubal is the old Roman Cetobriga. In 1755 it suffered severely from the earthquake that devastated Lisbon. Pilgrimages are made to the monastery of Arrabida, with its neighboring stalactite cave. The poet Bocage was born in Setubal. Pop. about 30,000.

SEVEN PINES, the name of a locality in Virginia, 6 miles from Richmond, where, May 31, 1862, the Confederates, commanded by Generals Longstreet and Stuart, defeated the Federals under Gen-

eral Casey. The battle received its name from seven solitary pine trees at the spot where the fiercest fighting took place. This battle may be considered as the beginning of the battle of Fair Oaks.

SEVENTEEN-YEAR LOCUST, the *Cicada septendecim.* There is no insect known to science which affords such an interesting study as does the seventeen-year locust. He begins and ends life in the bright sunshine, but spends 17 years in the dark, cold earth. Safely hidden from sight he gnaws away at the roots of trees, does his best to kill them, and then, emerging into the light, completes the death dealing operation by making as vicious an attack on the branches as was made on the roots. He is of a coal-black color, marked with bright orange yellow, and there is a white spot on the head just behind the eyes. There are four glassy wings, and the eyes are red.

When the insect emerges from the ground after its 17 years' burial it works its body rapidly backward and forward like a man trying to put on an extremely tight coat. The result of the movement is the breaking of the shell and the immediate appearance of its wings. It makes instantly for the nearest tree. The locusts pair at once. They then congregate on the branches of the trees in sufficient numbers to bend and at times break them by their weight.

The females prepare the nest by clasping a branch of moderate size and perforating it with holes by means of an awl-shaped piercing instrument with which they are provided. They repeatedly thrust this piercer obliquely into the bark and wood in the direction of the fibers, at the same time putting in motion the lateral saws which detach little splinters of wood and make a fibrous lid over the whole. In each fissure made by the piercer the female deposits from 10 to 20 eggs in pairs. It takes her a quarter of an hour to prepare one nest and fill it with eggs and she usually makes between 15 to 20 fissures in one limb. She lays between 400 and 500 eggs and then soon dies.

The perforations made in the limbs cause their death, and an orchard visited by seventeen-year locusts is ruined. Six weeks after the eggs are laid they hatch. The young when it bursts the shell is of a yellowish white color except the eyes and the fore claws, which are reddish. It is grublike in form and has six legs. On the shoulders, where 17 years later the wings appear, are little protuberances and directly under the breast is a long beak for suction. After being hatched the young locusts loosen their hold on the limb and fall to the earth. They instantly dig their way into the ground where they seek out the tender roots of plants and trees. These they cut with their beaks and draw out the vegetable juices which constitute their sole nourishment—and thus it is for 17 long years.

The drums of the male locust, on which they perform during their short lives above ground, are formed of convex pieces of parchment gathered into numerous fine plaits and are lodged in cavities behind the thorax. The insects play on these drums by the means of muscles which contract and relax with great rapidity.

SEVEN WEEKS' WAR, the great conflict in 1866 for German supremacy between Prussia and Italy on one side and Austria on the other, in which the allies were victorious.

SEVEN WISE MASTERS, the most common title given to a famous mediæval collection of stories, grouped round a central story, the history of which is almost the most important among the problems of storiology.

Of variant versions there are two principal groups, the Eastern and the Western, the first including all the texts in Eastern languages, and some more or less free translations from Oriental texts; the other including the "Dolopathos," the "Historia Septem Sapientum," the "Erasto," and many others. The Oriental texts have so many elements in common that they obviously spring from one book. The Western texts, though derivable from the Eastern, show great divergencies alike in the fundamental story and in the tales inserted in it. The real cause of this is that in the Western cases oral tradition has transmuted the contents.

SEVEN WONDERS OF THE WORLD, in ancient times, the Pyramids of Egypt, the Hanging Gardens of Semiramis at Babylon, the Temple of Diana at Ephesus, the Statue of Jupiter at Athens by Phidias, the Mausoleum, the Colossus at Rhodes, and the Pharos of Alexandria. This cycle of seven wonders originated among the Greeks after the time of Alexander the Great, and they were described in a special work by Philo of Byzantium.

SEVEN YEARS' WAR, a famous European war which lasted from 1756 to 1763. As the result of a war with PRUSSIA (*q. v.*) Maria Theresa of Austria had to cede Silesia to Frederick the Great. With a view to recover her lost territory she concluded an alliance with Russia, secured the support of Poland and Saxony, and attempted to form a closer union with France. In the meantime war broke out between France and England (1755), and George II., in order to protect his German states, concluded an alliance with

Prussia, while France agreed to aid Austria against Frederick. Being informed of these negotiations Frederick resolved to anticipate his enemies. In August, 1756, he invaded Saxony, occupied the chief towns, and compelled the Saxon army to surrender. This step created a stir in the European courts, and in 1757 Austria, Russia, France, Sweden, and the German empire were in arms against Frederick, while he had no ally but England and a few German states. In 1757 Frederick marched into Bohemia and gained a bloody battle at Prague (May 6). Soon after, however, the Austrians under Daun defeated Frederick at Kollin (June 18), relieved Prague, and forced the Prussians to retreat to Saxony and Lusatia. The French army, after defeating Frederick's German allies (under the Duke of Cumberland) at Hastenbeck, united with the imperial forces; Frederick met them at Rossbach and routed both armies on Nov. 5. He then hurried back to Silesia, which was occupied by the Austrians, and vanquished a superior army under Daun at Leuthen (Dec. 5), thus recovering Silesia. While Frederick was thus occupied in the S. and W., his General Lehwald had successfully repelled the Swedes and Russians on the N. and E.

The next campaign was opened in February, 1758, by Ferdinand, Duke of Brunswick, who, at the head of Frederick's allies, opposed the French in Lower Saxony and Westphalia. He defeated the French at Krefeld in June, and ultimately drove the enemy behind the Rhine. Frederick, driven out of Moravia, defeated the Russians, who had advanced to Zorndorf, in Brandenburg, was defeated in turn by Daun at Hofkirchen, but before the end of the year drove the Austrians from Silesia and Saxony. Louis XV. and his mistress, the Marchioness de Pompadour, were bent on continuing the war, and concluded a new alliance with Austria, Dec. 30, 1758. Frederick, however, had also obtained a new treaty with Great Britain, which promised him a large yearly subsidy. The new campaign was opened in March, 1759, Prince Henry, Frederick's brother, marched into Bohemia, where he dispersed the hostile forces, and captured immense quantities of military stores. The Russians, having defeated the Prussian General Wedel near Züllichau (July 23), advanced to Frankfort-on-the-Oder. Frederick hastened to meet them in person, and had already defeated them at Kunersdorf (Aug. 12) when his victory was snatched from him by the Austrians under Laudon, who inflicted on him a defeat such as he had never sustained before, Frederick's position was now extremely precarious. The Russians were victorious in his hereditary states, Daun was in Lusatia with a large army, and Saxony was overrun by the imperial troops. In the W. Frederick's allies had been more successful. On Aug. 1 Ferdinand gained a splendid victory at Minden over the French troops under Contades and Broglie. On the same day his nephew defeated the French at Gohfeld, and they were driven over the Lahn on one side and over the Rhine on the other. The Swedes, also, who, after the battle of Kunersdorf invaded Prussian Pomerania, were driven by Manteuffel and Platen under the cannon of Stralsund. The campaign of 1760 seemed at first to forebode ill success to Frederick. While he himself was engaged in Saxony Fouqué suffered a defeat in Silesia, in consequence of which the Austrians occupied the whole country. Frederick thereupon gave up Saxony in order to recover Silesia. On Aug. 15 he defeated Laudon at Liegnitz, by which he effected his purpose of recovering Silesia. He then returned to Saxony and attacked the imperial forces at Torgau, on the Elbe (Nov. 3), defeated them in a bloody engagement and went into winter quarters in Saxony. The Russians also were forced to retire to Poland, and Ferdinand defeated the French at Warburg (July 31).

In the campaign of 1761 the operations of Ferdinand of Brunswick and the French on the Rhine consisted of alternate advances and retreats, and the Russians and Austrians were so enfeebled that they failed to make any impression on Frederick's remnant of an army. In the campaign of 1762 the French were defeated (June 24) at Wilhelmsthal, and Cassel surrendered to the allies on Nov. 1. Two days after this the preliminaries of peace between Great Britain and France were signed, and the peace itself was confirmed at Paris, Feb. 10, 1763. After a short negotiation Frederick concluded a peace with Austria and Saxony at Hubertsburg (Feb. 15), by which he retained Silesia. The war in Europe was accompanied by war by sea and land between the French and British abroad, the result of which was to give Great Britain a decided superiority over France both in America and India.

SEVERN, the second largest river in England, formed by the union of two small streams which rise in Mount Plinlimmon, Montgomeryshire. It flows through Montgomeryshire, Shropshire, Worcestershire, and Gloucestershire, passing the towns of Newtown, Welshpool, Shrewsbury, Worcester, Tewkesbury, Gloucester, and Bristol, and after a circuitous S. course of about 210 miles falls

into the Bristol Channel. It receives the Tern, Upper Avon, and Lower Avon on the left, and the Teme and Wye on the right. Its basin has an area of 8,580 square miles. It is navigable to Welshpool, about 178 miles above its mouth and 225 feet above sea-level. Below Gloucester its navigation is much impeded, but this has been obviated by a canal from this city to a point on the estuary 2 miles from Berkeley, capable of carrying vessels of 350 tons. Below Gloucester the banks become so low that destructive inundations have not infrequently occurred. These have been partly caused by one of the most remarkable features of the river, its bore, or by the height of the tides, which at the mouth of the Avon sometimes exceed 48 feet, and at Chepstow attain even 60 feet. A railway tunnel 4½ miles long has been driven below the river from near Avonmouth, in Gloucestershire, across to Monmouthshire, and a railway bridge, 3,581 feet long, crossing the river at Sharpness higher up.

SEVERUS LUCIUS SEPTIMIUS, a Roman emperor; born near Leptis Magna, on the coast of Africa, April 4, 146. After holding the highest offices under Marcus Aurelius and Commodus, he obtained command of the legions in Gaul, and when in 193 news came of the murder of Pertinax, he was proclaimed emperor and immediately marched on Rome. Julianus, to whom the prætorian guard had sold the imperial purple, was deposed and executed. Meanwhile the Roman legions in Asia had proclaimed their general, Pescennius Niger, emperor. Severus overthrew him at Issus in 194. After a successful campaign against the Parthians, he returned to Rome, but was soon engaged in a struggle with another rival, Clodius Albinus, whom he conquered at Lugdunum in 197. New campaigns in the E. were ended by the capture of Ctesiphon, the Parthian capital. Severus then spent several years (202-208) at Rome, gratifying the people by his magnificence, and distributing large donations to the troops. In 208, he hastened to Britain to quell a rebellion there. He died in Eboracum (York), Feb. 4, 211.

SEVERUS, WALL OF, the name given to the wall or barrier formed at the boundary of the Roman empire in Britain between the Solway and the Tyne by the Roman emperor Severus about A. D. 210, following the line of a similar structure made in the reign of Hadrian (A. D. 120), and usually called Hadrian's Wall. It was more than 70 miles long; on the N. toward Scotland was a great ditch, on the S. edge of this was a stone wall varying from 6 to 9 feet in breadth and about 16 feet high, with towers between 50 and 60 feet square at intervals of about a Roman mile. Remains of it are still to be seen over long ranges of country.

SÉVIGNÉ, MARIE DE RABUTIN-CHANTAL, MARQUISE DE (sāv-ēn-yā'), a French letter-writer; born in Paris, France, Feb. 6, 1626. Left an orphan young, she was reared by a maternal uncle, receiving an excellent education and having access to the court. In 1644 she married Henri, Marquis de Sévigné, who fell in a duel in 1651. It was to her daughter, Mme. de Grignan, that she wrote her letters, which are of value both from an historical point of view and for their charm of style. She died in the Castle of Grignan, Dauphiny, April 17, 1696.

SEVILLE (Spanish, *Sevilla*), a famous city of Spain; capital of the province of the same name; on the left bank of the Guadalquivir, 80 miles from its mouth, and 353¾ miles S. S. W. of Madrid. The river is crossed by a fine iron bridge connecting Seville with Triana (the gipsy quarter), one of its suburbs. The city proper, which is surrounded by old Moorish walls, 5 miles in circumference, with 66 towers and 15 gates, contains a labyrinth of narrow crooked streets. The houses are mostly built in the Moorish style, and are seldom more than two stories high, with flat roofs, and an inner square court surrounded with colonnades and adorned with flowers and fountains. The windows generally look into this court; to the street there is most frequently only a balcony. The city has many fine promenades, of which the most frequented are the Alameda Vieja, El Passeo de Christina and Las Delicias. Of its 111 squares, the largest are Plaza de San Francisco, Plaza de la Encarnacion, Plaza del Duque, and the Quemadero —the scene of the *autos-da-fe;* while of its numerous streets, the chief are Calle de la Sierpe and Calle Francos. Most of the more notable public edifices are at the S. extremity near the river, and within a short distance from each other. Here are the Cathedral (Santa Maria de la Sede), the Giralda, the Alcazar, the Lonja, and (outside the wall), the royal Fabrica de Tabacos.

The Cathedral (1401-1519), on the site of the grand mosque of the Moors, is one of the most imposing Gothic edifices in Europe. It is 431 feet long, 315 feet wide, 145 feet high under the transept dome, has seven aisles, 93 windows, several of which are beautifully painted, and an organ with 5,400 pipes. It contains the "Biblioteca Columbiana" of 42,000 volumes, bequeathed by Ferdinand Colum-

bus, and is rich in paintings by Murillo, Campaña, the Herreras, and other masters of the school of Seville. The Giralda is a square Moorish steeple, consisting of three towers with galleries and balconies, 350 feet high, the ascent of which is by a spiral inclined plane. On the top is a bronze statue of Faith, 14 feet high, and weighing 2,800 pounds, which yet turns like a weathercock. The Alcazar was the ancient Moorish palace. Some parts of its interior are as fine as the Alhambra. The Lonja, or Exchange, is a square building, each side 100 feet long, in which all the American archives are preserved. The Fabrica de Tabacos, or tobacco factory, in which several thousand persons are employed, was erected in 1757. Other buildings are the Torre del Oro, a 12-sided tower on the river, so called from its having received the cargoes of the American treasure ships; the palace San Telmo, built by Ferdinand Columbus, afterward owned by the Duke of Montpensier; Casa de Ayuntamiento (town house), a fine Renaissance structure; the Casa de Pilatos, or palace of the Dukes of Alcala; the Museo, rich in paintings by Murillo, Zurbaran, Torrigiano, Roelas, and the elder Herrera; and the great amphitheater, capable of accommodating, as a Plaza de Toros, 18,000 people.

One of the greatest monuments of antiquity is the Caños de Carmona, an aqueduct on 410 high arches, which conveys water from Alcala de Guadaira. It was built by the Romans and repaired by the Moors. Seville has a university, founded 1502, with a library of more than 20,000 volumes; 12 picture galleries (including the Musco), two theaters, several upper schools and learned societies. The city is visited by large numbers of strangers during the Santa Semana ("holy week"), which commences about the middle of April. Seville has a great export of oranges, and large manufactures of tobacco, hardware, porcelain, and silk. Pop. (1918) 164,046.

Seville was the Hispalis of the Romans, in whose time it was a place of great commercial importance. Under the Vandals and Visigoths it became the capital of southern Spain. Within its walls were held the Concilia Hispalensia, 590 and 619. In the 8th century, it fell into the hands of the Moors, by whom it was called Ischbilia, and made the capital of a caliphate. It now became the most flourishing city in the peninsula, having a population of 400,000. In 1248 it was taken, after a siege of 18 months, by Ferdinand III. of Castile, and has ever since remained in the hands of the Christians.

SÈVRE (sāvr), the name of two rivers in France. The Sèvre Nantaise rises in the department of Deux-Sèvres, and flows into the Loire opposite Nantes after a course of 86 miles. The Sèvres Niortaise rises 31 miles more to the S. E., in the same department, and flows into the Atlantic 10 miles N. of La Rochelle after a course of 89 miles. The department of Deux-Sèvres takes its name from these two rivers.

SÈVRES, DEUX ("two Sèvres"), a department in France, bounded by Maine-et-Loire, Vienne, Charente, Charente-Inférieure, and Vendée; area, 2,337 square miles; pop. about 340,000. A branch of the Cévennes traverses the department from S. E. to N. W. Cereals, leguminous crops, and hops are grown. The vine, though extensively cultivated, yields only an inferior wine. The forests are chiefly of hard wood. The minerals include iron, millstones, pavement, and limestone in abundance. The principal manufactures are linen and cotton goods, serge, flannel, woolen hosiery, and gloves. Capital, Niort.

SEWAGE, the matter which passes through the drains, conduits, or sewers leading away from human habitations singly, or from houses collected into villages, towns, and cities. It is made up of excreted matter, solid and liquid, the water necessary to carry such away, and the waste water of domestic operations; but to these are added the liquid waste products of manufacturing operations, and generally much of the surface drainage water of the area in which the conveying sewers are situated.

There can be no doubt that the pestilence and plagues which at frequent intervals devastated ancient and mediæval cities were almost invariably caused, and always intensified, by the entire absence of any system for treating or removing excreta and other decaying organic matter; and even yet, notwithstanding the assiduous regard paid to sanitary science in most well-governed towns, many diseases are directly traceable to the noxious influence of decomposing sewage matter. It is not too much to say that the efficient and economical treatment of towns' sewage is the greatest and most urgent social problem of our times.

The question presents itself in a twofold aspect: (1) the necessity for the prompt and complete removal of sewage from the neighborhood of human dwellings, and its disposal in a way the least offensive and injurious to health; (2) the desirability of saving, for agricultural purposes, the rich and essential fertilizing agents which sewage contains. To the sanitary officer the former is the question of greatest moment, to the agri-

culturist the latter; while the mass of the population has an equal interest in both.

The composition of sewage as it passes outward, varies greatly, as regards amount and condition of organic matter it contains, and the season of the year—hot or cold—affects very considerably the activity of chemical action. But at all times sewer gases are given off which are fetid and offensive to smell, containing sulphuretted hydrogen, light carburetted hydrogen, free nitrogen, and carbonic acid. To prevent sewer gases from penetrating into houses by means of the drains and pipes, and to keep the sewage from saturating the surrounding soil, and from contaminating any water supply, are objects of prime importance. To accomplish these, the pipes leading from dwellings into main drains and sewers require to be trapped, and the sewers themselves ventilated, drain pipes and tubes made of glazed earthenware or other non-absorbent material must be carefully fitted, and the main sewers made either of pipes of large diameter or of hard bricks bedded in Portland cement. Sewers are properly built in cross section; they should have a uniform gradient, and be as far as possible built free of curves, so that the sewage matter may be carried forward without any tendency to silt or deposit at particular spots. It is also essential that there be ready access to the sewers, as well as to the smaller drains leading into them.

The entrance of sewer gas into houses is provided against by external ventilation of the pipes and by trapping the pipes either by a syphon arrangement, a midfeather, or a flap trap. The midfeather is a modified kind of syphon, consisting of a trough having an inlet and discharge pipe at the same level on opposite sides, but between them a partition passes down into the water with which the trough is always filled up to the level of the two pipes. Such traps are usually put upon sinks. The flap trap consists simply of a hinged valve which opens outward to allow the escape of sewage, etc., but which closes against the resurge of water or the inward pressure of gases. Modified forms of these varieties are numerous.

SEWAGE DISPOSAL. The problem of the disposal of sewage becomes one of immense importance in all thickly populated districts. In the country, a properly constructed cesspool in favorable soil forms a simple and satisfactory means of disposing of domestic waste, but in cities the cesspool becomes utterly inadequate and some means of removing sewage wholesale has to be devised. No system at present in common use can be considered perfect. Sewage contains much material of value, and its destruction involves a great economic waste. Owing to the large quantities of humus and nitrogenous matter which it contains, its fertilizing properties are great, and there are in it considerable amounts of grease and fat which only need extracting and purifying to find industrial application. At the present time, however, most cities are concerned only with the disposal of the sewage in an economical, sanitary and inoffensive manner and do not concern themselves with the recovery of by-products. There are several methods of sewage disposal, but one feature, common to them all, is the sewer. These sewers almost invariably carry off rain as well as domestic and industrial sewage, but in some cities an arrangement is made by which the ordinary rainfall goes into the sewer, while heavier rains are diverted into special channels. The purpose of this is to avoid having to deal with large volumes of dilute sewage, a point which is of importance in some systems, as will be seen later.

It is clear that the sewer does not solve the problem of sewage disposal. It removes the sewage from the city, but sooner or later there must arise the problem of dealing with the effluent from the sewer. In cities located near the coast, it is common to lead the sewer into the sea to a point well beyond low tide. Those with a river running through, or near, them, frequently turn their sewage into the river—a practice with many obvious objections and dangers. Inland towns far from rivers or large bodies of water have no such easy solution of their difficulties. So-called "sewage farms" are frequently resorted to. The sewage is treated in settling tanks with lime, or with mixtures of lime and sulphate of iron or alumina, by which means the solids are precipitated, leaving the supernatant liquor comparatively pure. The sludge is spread over the land which is cultivated. This system comes nearest to Nature's method of purification, and it has the good feature of utilizing the fertilizing properties of the sewage. It is, however, seldom entirely inoffensive. Sometimes the sludge is treated in filter presses, and the comparatively dry cake dug into the earth or even burned. The septic tank treatment is one which has met with success in some cases. The sewage is caused to flow into tanks where it receives successive treatment with anaërobic and aërobic bacteria. Theoretically, solid matter should become liquified and the final effluent be harmless and inoffensive. Many industrial effluents, however, contain matter which poisons the bacteria,

when, of course, the whole system breaks down.

SEWARD, FREDERICK WILLIAM, an American lawyer; born in Auburn, N. Y., July 8, 1830; was graduated at Union College in 1849; admitted to the bar in 1851; and for 10 years was one of the editors and owners of the Albany "Evening Journal." He was sent to warn Abraham Lincoln of the plot to assassinate him in Baltimore in 1861; was assistant Secretary of State in 1861-1869 and 1877-1881; accompanied Admiral Porter on the special mission to negotiate West India treaties in 1867; participated in the purchase of Alaska; was a member of the New York Legislature in 1875; State Commissioner at the Yorktown Centennial Celebration in 1881; and author of "Life and Letters of William H. Seward"; "A West Indian Cruise"; and numerous lectures, magazine articles, etc. He died in 1915.

SEWARD, WILLIAM HENRY, an American statesman; born in Florida, Orange co., N. Y., May 16, 1801. He studied for the bar, and began practicing in Auburn in 1823, but gradually drifted into politics, and in 1830 was elected a member of the New York Senate. Displaying marked abilities as a politician, he was in 1838 and 1840 chosen governor of his native State, and in 1849 was elected to the United States Senate. He was the friend and adviser of President Taylor, and distinguished himself by his firm resistance to the extension of slavery. In 1860 he was a candidate for the presidency, but being defeated in the convention by Abraham Lincoln he exerted himself to secure Lincoln's election. Lincoln afterward appointed Seward Secretary of State, in which post he discharged his duties with great ability, showing notable tact in dealing with Great Britain in the "Trent Affair," inducing France to withdraw her troops from Mexico, and effecting the cession to the United States by Russia of Alaska (1867). He was dangerously wounded in April, 1865, when President Lincoln was assassinated, but recovered and filled the same office under Lincoln's successor, Andrew Johnson. He resigned his post on the accession of President Grant in 1869. He wrote a "Life of John Quincy Adams"; his "Speeches, Correspondence, etc.," appeared in 1869; and an "Autobiography," with continuation, in 1877. He died in Auburn, Cayuga co., N. Y., Oct. 10, 1872.

SEWARD, MOUNT, a mountain in Franklin co., N. Y.; is a summit of the Adirondacks, 14 miles W. of Mount Marcy, and was named for William H. Seward; height, 4,384 feet.

SEWARD PENINSULA, the most western part of Alaska. It has an area of about 22,700 square miles. The coast is low, but there are hills in the interior which are covered with forests of spruce. It includes an important gold mining region, including Nome, Anvil Creek, and Ophir Creek. The gold is obtained almost entirely from placer mining and over $70,000,000 worth has been taken from the district. The production in 1919 was near $6,000,000. The peninsula is divided into five mining districts, Nome, Council, Kougarok, Fairhaven, and Port Clarence. In recent years gold lodes have been discovered, and placer mining is being superceded. Tin is found in the Cape York region. Coal also exists but has not yet been mined. Nome is the chief settlement. Others are Candle, Deering, Teller, Wales, and Sinuk.

SEWELLEL, the *Haplodon rufus*, a small rodent from the W. coast of America. It is about a foot long, with a tail of an inch or an inch and a half, brownish above, lighter below. Its habits are approximately those of the PRAIRIE DOG (*q. v.*). It constitutes the genus *Anisonyx* of Rannesque, *Aplodontia* of Richardson, and *Haplodon* or *Haploödon* of later writers. Lilleborg makes it the type of a family *Haploödontidæ*.

SEWING MACHINE, a machine for sewing or stitching cloth, leather, etc. The various forms of this now well-known and almost universally used machine are all of quite recent introduction. The invention of the double-pointed needle with an eye in the center, in the year 1755, marked a distinct advance toward the invention of the sewing machine, and it was itself used in a form of machine for producing the "shoemaker's stitch." In the eye of the double-pointed needle the sewing thread was fastened, and by a pair of grippers or mechanical fingers the needle was pushed and pulled alternately from the opposite sides of two folds of the material to be sewed.

In 1830 Barthelemy Thimonier, a Frenchman, obtained in his native country a patent for a form of sewing machine which was for some time successfully worked, and which was in effect the parent of the single-thread machines now in use. In Thimonier's apparatus, which was constructed largely of wood, the thread carrier was placed under the table whereon the fabric to be sewed was laid. The needle was in the form of a crochet hook, and having a descending and ascending motion, it passed through the cloth, brought up a loop of thread, which was caught and retained by a nipple till the hooked needle brought up a second loop. The second loop passed through loop No.

1, which thereupon was released and drawn tight, a chain stitch was thus formed, and the cloth being moved forward the length of a stitch, the process was repeated and continued.

Between 1832 and 1834, Walter Hunt, a New York mechanician, invented and sold several sewing machines which made a practical lock stitch. He, however, neglected to apply for a patent.

The invention of the eye-pointed needle by Newton & Archibald, patented in 1841, and applied by them to the stitching and tamboring of the back of gloves, formed the most important step in the progress of developing the sewing machine, and in no essential principle did their machine differ from the single-thread machines now in use. In 1844 an invention by John Fisher was patented jointly with James Gibbons, in which a shuttle and needle were used for producing a lock stitch, and by a different combination the patent covered the production of what subsequently was known as the Grover & Baker, or knotted stitch. Elias Howe's invention was patented in the United States by himself, and in England by William Thomas in 1846. Howe, after several years' labor and study, worked out the idea of his sewing machine without any guidance from or knowledge of what had been previously accomplished; and he moreover secured such effective combinations of parts as made the Howe machine in reality the acknowledged parent of all the forms since introduced.

His patent-right for Great Britain was sold for $1,250 to Mr. Thomas, in whose employment Mr. Howe worked for about two years. On returning to the United States in 1849, Howe found that notwithstanding his patent right, several individuals had made, exhibited, and used sewing machines, though not a single machine had yet been made in the United States under his patent. He had, therefore, to face the task of vindicating his rights. It was not till the end of 1850 that the manufacture of his machine actually began, and it was 1854 before a decision in his favor against I. M. Singer was obtained.

The modifications, improvements, and additions made to the sewing machine since its introduction are innumerable. It has now been adapted to produce almost all kinds of stitching which can be done by the hand; and every variety of work required on garments. The leading classes of machines are: (1) Single-thread machines, (2) machines with two or more threads, and (3) overhead or glove-stitch machines.

Single-thread Machines.—The stitch made by the ordinary form of single thread machine is precisely what is known as the crochet stitch, and when the thread is broken at any point the whole work readily undoes. Ordinary single-thread machines, unless for limited applications, such as glove embroidery, are passing out of general use. It is different, however, from the Wilcox & Gibbs single-thread machine, in which a revolving double hook or looper is employed which gives each loop a twist and produces thereby the twisted chain stitch, combining a solid fastening with great elasticity and smoothness.

Two-thread Machines.—Of these machines two subdivisions may be recognized —the lock stitch, and the knotted or double chain stitch, commonly called the Grover & Baker machines. Of these, the lock stitch machines are by far the most common, and for general purposes are in almost universal use. For producing the lock stitch there are two forms of apparatus: (1) the reciprocating shuttle which carries a thread through the loop made by the needle, and (2) the lenticular spool or thread case over which the loop is passed by a revolving hook. Of the first kind—shuttle machines—the Howe, the Singer, the Wanzer, and others are familiar forms; the second, or spool and hook appliance, is a peculiarity of the Wheeler & Wilson alone. The needle was originally fixed at the end of a vibrating arm, and, describing the arc of a circle, it required to be curved. Singer first introduced the straight needle carried by a slide, and it now is in general use. Next to the invention of the eye-pointed needle the designing of an efficient feed motion was the most important improvement made in the sewing machine. Singer introduced what is called the wheel feed, but the plan now adopted is one of the many ingenious and beautiful mechanical devices introduced by A. B. Wilson, of Wheeler & Wilson. It is called the four-motion feed, and consists of a serrated plate to which a forward, down, backward, and upward motion is communicated, the forward and backward motion being varied according to the length of stitch. The tension of the thread in the shuttle is maintained by a small nipping spring which presses against the thread. In the Wheeler & Wilson machine the use of the shuttle is entirely avoided, and the lock stitch is formed by carrying the loop from the upper thread over and around the under thread, which is contained within a small lenticular spool, which fits snugly but free in a recess in the side of the revolving hook. This exceedingly ingenious device, together with the four-motion feed above alluded to, place Mr. Wilson, their inventor, in the front rank of improvers of the sewing machine. The Wheeler &

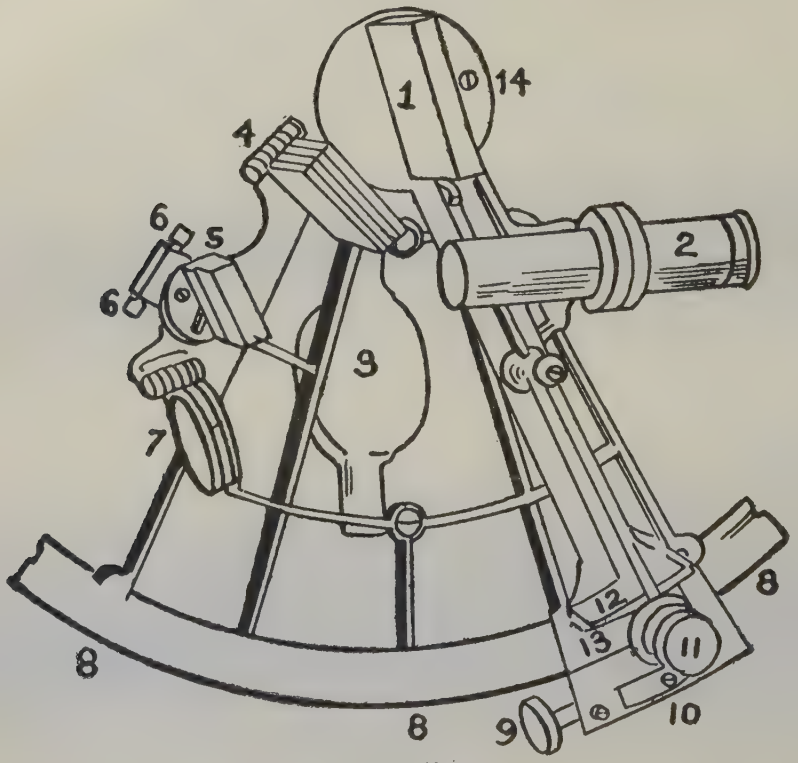
Wilson machine works with great ease and smoothness, and as the machine can be noiselessly worked at a high speed, it is a great favorite for general domestic and light manufacturing uses. The ordinary Grover & Baker machine makes a knotted or double loop chain stitch of a complex character. For general purposes it is not now in great favor, owing to the ridged nature of the seam it makes, and to the considerable waste of thread the peculiar nature of the stitch involves.

Overhead Machines. — In overhead stitching two edges are sewed together by the thread passing over and binding in their outer extremities, a style of sewing generally seen in gloves and invariably used for sacks. In order to effect the sewing of sacks with this stitch by machinery, many attempts have been made, and some of them have attained a degree of practical success. In Laing's overhead machine, invented and manufactured in Dundee, a helical needle is employed, which in its motion of rotation passes from end to end to the sack seam, drawing the thread through with it.

SEXAGESIMA SUNDAY, the second Sunday before Lent, the one immediately before Shrove Tuesday, so called because it falls about 60 days before Easter.

SEXTANS ("the Sextant"), one of the 10 new constellations added to the heavens by Hevelius in his "Prodromus Astronomiæ" (Forerunner of Astronomy), in 1690, of which eight have survived to the present day. It is surrounded by Leo, Crater, and Hydra. Not having been known as a constellation in Bayer's time, it has gone without Greek letters attached to its stars till recently, when Gould assigned them to five of its brightest stars. It is a very inconspicuous constellation, the brightest star being only of the 4.9 magnitude.

SEXTANT, an instrument for measuring the angular distance of objects by means of reflection. The principle of its



SEXTANT

1. Mirror.
2. Telescope.
3. Handle.
4. Shade Glasses.
5. Horizon Glasses.
6. Adjusting Screw.
7. Black Shade Glasses.
8. Arc.
9. Index Tangent Screw.
10. Sliding Limb.
11. Reading Glass.
12. Vernier Shade.
13. Vernier.
14. Mirror Adjusting Screw.

construction depends on the theorem that if a ray of light suffer double reflection the angle between the original ray and its direction after the second reflection is double the angle made by the reflecting surfaces. The instrument of which this theorem is the principle is a brass sector of a circle in outline, the sector being the sixth part of a complete circle, for which reason the instrument is called a sextant. It consists of a graduated limb, forming about the sixth part of a circle. Two mirrors, the index mirror (1) and the lower part of the horizon glass at 5, have for object the reflection of the rays of light coming from the object under observation. The telescope (2) collects and transmits to the eye the rays of light emanating from the horizon glasses. An index and a vernier (13) permit the reading, on the graduated limb, of the quantity of light which the mirror has turned. When observing altitudes, the instrument is held perpendicularly to the horizon in the plane of the line joining the two objects. In taking noon observations at sea, to determine the latitude, the observer takes his place shortly before meridian, and turning down one or several of the shades, to prevent his eye being injured by the glare, directs the telescope or site tube to the sun, moving the index so as to bring its reflected image to coincide with the sea horizon; as the sun rises, he gradually advances the limb, clamping it and using the regulating screw for this purpose, as the sun's path becomes more nearly horizontal, and slightly rocking the instrument from side to side to insure that it is in a vertical plane at the moment when the sun attains its greatest height. The reading of the limb at the moment when the sun begins to dip is noted, and a very simple calculation, adding his declination derived from the "Nautical Almanac" to the true zenith distance obtained by observation, gives the latitude.

SEXTON, an under officer of the church, whose duty is to take care of the vessels, vestments, etc., belonging to the church, to attend on the officiating minister, and perform other duties pertaining to the church, to which is, in England, added the duty of digging and filling up graves in the churchyard.

SEXUAL SELECTION, a term applied by Darwin to the process of favoring and eliminating which to some extent occurs in the mating of many animals. It is a special case of natural selection, depending on a competition between rival males, in which a premium is set on those qualities which favor their possessors in securing mates. This competition takes two forms: On the one hand, rival mates, for instance stags and gamecocks, fight with one another, and the conquerors have naturally the preference in mating; on the other hand, rival males sometimes seem to vie with one another in displaying their attractive qualities before their desired mates, who, according to Darwin, choose those that please them best.

Where there is direct competition between males, the weakest will tend to be eliminated, either directly by death or injury in the struggle, or indirectly by diminished success in reproduction. In the same way, if a male be lacking in the qualities necessary to find a mate—*e. g.*, in senses acute enough to find out her whereabouts—that male may remain unreproductive.

In regard to the second aspect of sexual selection, in which the females are believed to exercise some choice, giving the preference to those suitors which have brighter colors, more graceful forms, sweeter voices, or greater charms of some kind, there is no little difference of opinion. Darwin indeed believed strongly in the female's choice, and referred to this process of selection many of the qualities which distinguish male animals. On the other hand, Alfred Russel Wallace maintains a very different position. "There is," he says, "a total absence of any evidence that the females admire or even notice the display of the males. Among butterflies there is literally not one particle of evidence that the female is influenced by color or even that she has any power of choice, while there is much direct evidence to the contrary."

The theory of sexual selection is of considerable importance in a general theory of evolution. This may be illustrated in reference to the bright plumage of many birds. If we believe that the females are sensitive to the slight excellences which distinguished one suitor from another and that their choice of mates is determined by these excellences (which Wallace emphatically denies), then we may say that the greater brightness of male birds may have been evolved by sexual selection. This was Darwin's opinion.

Before we can believe that attractively bright ornaments could become characteristic of males by sexual selection, or that protectively plain coloring could become characteristic of females by natural selection, we must assume that the qualities of brightness can be entailed in inheritance on the males only, and the qualities of plainness on the females only. But this fundamental assumption has not yet been justified by a sufficiently strong body of facts.

Wallace has also in his work on "Darwinism" (1889) worked toward a ra-

tional interpretation of the variations which he was previously content to postulate as facts. For he says that "ornament is the natural outcome and direct product of superabundant health and vigor," and is "due to the general laws of growth and development." It seems to some that this mode of interpreting characters is of far-reaching importance, and that it affects not only the theory of sexual selection but that of natural selection as well.

To sum up, the problems involved in sexual selection are (1) what physiological conditions explain the secondary sexual characters which so often distinguish males and females; (2) to what extent and in what degree of refinement does preferential mating occur; and (3) to what extent has sexual selection guided the differentiation of the sexes alike in distinctive qualities and in æsthetic sensitiveness? Before these problems can be adequately solved many more facts must be accumulated.

SEYCHELLES (sā-shel'), a group of about 90 islands in the Indian Ocean; between lat. 3° 40′ and 5° 35′ S., and lon. 55° 15′ and 56° E. They were first occupied by the French, and were ceded to the British in 1814. The settlers are mostly of French extraction. The largest island is Mahé, the majority of the others being mere rocks. With the exception of two consisting of coral, they are composed of granite piled up in huge masses, and terminating in peaks. Most of them are covered with verdure, and yield good timber. Cotton, coffee, cocoa, spices, tobacco, maize, rice, and tropical fruits are cultivated; and cocoanut oil, soap, vanilla, etc., exported. Pop. (1918) 24,572.

SEYCHELLES COCOANUT, the *Lodoicea Sechellarum*, a remarkable palm found only on two or three small rocky islands of the Seychelles group. The fruit takes several years to come to maturity, when it attains a gigantic size, weighing often 40 to 50 pounds, and consists of a thick fibrous rind inclosing one or more nuts divided half-way down into two lobes. The unripe fruit is eaten, and the hard black shell of the nut is carved into ornaments and fakirs' drinking cups. The leaves when young yield a beautiful material for basket and plaited work; hats, fans, etc., are made from them; when full grown they are used for partitions and roofs of houses. See PALM.

SEYMOUR, a town of Connecticut, in New Haven co. It is on the Naugatuck river, and on the New York, New Haven, and Hartford railroad. It is an important industrial city and has manufactures of paper, iron castings, wire, tools, submarine cables, copper, fountain pens, etc. Pop. (1910) 4,786; (1920) 6,781.

SEYMOUR, a city of Indiana, in Jackson co. It is on the Baltimore and Ohio Southwestern, the Pittsburgh, Cincinnati, Chicago, and St. Louis, and the Chicago, Terre Haute, and Southeastern railroads. Its industries include woolen mills, flour mills, printing houses, saw mills, furniture factories, carriage factories, etc. It has the repair shops of the Baltimore and Ohio Southwestern railroad. Its public buildings include a public library and a farmer's club building. Pop. (1910) 6,305; (1920) 7,348.

SEYMOUR, an historic family, originally settled in Normandy at St. Maur—whence the name. Going over to England, they obtained lands in Monmouthshire as early as the 13th century, and in the 14th at Hatch Beauchamp, Somersetshire, by marriage with an heiress of the Beauchamps. In 1497 SIR JOHN SEYMOUR helped to suppress the insurrection of Lord Audley and the Cornish rebels, and subsequently he accompanied Henry VIII. to his wars in France, and to the Field of the Cloth of Gold. For his daughter, see SEYMOUR, LADY JANE; his fourth son, THOMAS, created Lord Seymour of Sudeley, became Lord High Admiral of England and the second husband of Henry's widow (Catharine Parr), but ended his life on the scaffold (1549). Sir John's eldest son, EDWARD, was successively created Viscount Beauchamp, Earl of Hertford, and Duke of Somerset, and as Protector played the leading part in the first half of the reign of EDWARD VI. (*q. v.*). The Protector's eldest son by his second marriage, being created by Elizabeth Earl of Hertford, married the Lady Catharine Grey, a grand-niece of Henry VIII., and sister of the unfortunate Lady Jane Grey—a marriage which entailed on him a nine years' imprisonment and a fine of $75,000. His grandson, who in 1621, succeeded him in the earldom of Hertford, also fell into disgrace for attempting to marry the Lady Arabella Stuart, cousin of James I., but subsequently, playing a conspicuous part in the royalist cause in the Great Rebellion, obtained a reversal of the Protector's attainder, and in 1660 took his seat in the House of Peers as 3d Duke of Somerset, though the descendants of the first duke, by his first marriage, were then in existence. He died unmarried in 1671, and the ducal title ultimately passed to a cousin, on whose death it was inherited by CHARLES SEYMOUR (1661-1748), known in history as the "Proud Duke of Somerset," a nobleman whose style of living was ostentatious and haughty in the extreme, and who filled several high posts

in the courts of Charles II., William III., and Anne. He married the heiress of the Percies, by whom he had a son, ALGERNON, 7th duke, who in 1749 was created Earl of Northumberland, with remainder to his son-in-law, Sir Hugh Smithson, the ancestor of the present Percy line. On the death of this duke in 1750 a curious peerage case arose, the title being claimed by the descendants of the 1st duke by his first marriage; and the attorney-general having reported in favor of the claim, SIR EDWARD SEYMOUR took his seat in the House of Peers as 8th duke. The earldom of Hertford, which became extinct in 1750, was in that same year conferred on this 8th duke's first cousin, FRANCIS, who in 1793 was advanced to the dignity of marquis.

SEYMOUR, SIR EDWARD HOBART, a British admiral, born 1840. He was educated at Radley and entered the navy in 1852. He became commander in 1866, reaching the grade of admiral in 1901. He served in the Black Sea during the Crimean War and was present at the bombardment of Odessa, Sebastopol, and Kinburn in 1854-5. He was in the China War, was present at the capture of Canton, and was wounded on the coast of Africa in 1870. He was commander-in-chief at Devonport in 1903-5 and represented England at New York for the Hudson Fulton celebration in 1909. He wrote: "My Naval Career and Travels."

SEYMOUR, HORATIO, an American statesman; born in Pompey Hill, Onondaga co., N. Y., May 31, 1810. After serving three terms, with marked ability, in the New York Legislature, in 1852 he was elected governor on the Democratic ticket. At the outbreak of the Civil War he was decidedly in favor of the supremacy of the Constitution, and as governor a second time (1863-1865) showed conspicuous energy and ability in raising troops. His second incumbency of the governorship was marked by the draft riots in 1863. In 1868 he was defeated for the presidency by General Grant. As an orator, Mr. Seymour was easy, agreeable, and powerful, rising often into true eloquence. He died in Utica, N. Y., Feb. 12, 1886.

SEYMOUR, LADY JANE, the third wife of Henry VIII., and the mother of Edward VI.; born in England, about 1510. She was at first maid of honor to Anne Boleyn, whom she supplanted in 1536. She died Oct. 24, 1537, a few days after giving birth to her son.

SFAX, a town on the E. coast of Tunis, situated in the midst of fruit gardens. It is surrounded by walls and bastions, and has a strong citadel. It exports large quantities of fruit, wool, sponges, alfa, etc. Sfax was captured by the French after a two days' bombardment on July 16, 1881. Pop. about 45,000.

SGRAFFITO, or SCRATCHED WORK, the name given to a mode of external wall decoration practiced in Italy, and of which examples have been found in Pozzuoli near Naples, of the date of about 200 B. C. The process is accomplished by means of superimposed layers of plaster applied and operated on in the following manner: First, the wall having been thoroughly moistened to insure adhesion, a ¾-inch coat of plaster is floated on, and before it is perfectly dry a ¼-inch skin of black, red, or any other colored plaster that will not fade is applied; when this is set and while it is still wet, a finishing coat of white plaster is added. A full-sized drawing of the design that is to be realized is then transferred to this outer coating, and the outline cut through to the second coat with a sharp instrument, and made broad or narrow according to the effect desired, and where necessary these incisions are enforced by additional lines as shading. Examples of the system are to be found in the choir boys' school of St. Paul's Cathedral, the inner court of the Science Schools at South Kensington, and the interiors of some churches in England. There are 15th-century specimens of sgraffito pottery in the South Kensington Museum. The examples of house decoration in Italy are of the 15th, 16th, and 17th centuries.

SHACKLETON, SIR ERNEST HENRY, a British Antarctic explorer, born in 1874, at Kilkee, Ireland. He served for a time in the commercial marine and as an officer of the Royal Naval Reserve, serving as a lieutenant under Captain R. F. Scott, on the British National Antarctic expedition, from 1901 to 1904. In 1907 he organized and commanded an expedition during which he made valuable explorations, reaching the south magnetic pole for the first time. He personally led a party which reached the latitude of 88° 27′, within 97 miles of the pole. This passed all previous records by 366 geographical miles. He discovered the pole and an enormous glacier, and mountain ranges. The journey ended in a vast polar plateau, about 11,000 feet above sea-level. He was engaged, in 1914-16, in an attempt to cross the continent of Antarctica from Coats Land to McMurdoo Sound. The expedition ended by the destruction of its ship, the "Endurance." The crew, after many dangerous adventures, reached Elephant Island, and Shackleton, leaving 23 men on the island, made a voyage with five

others in a whale boat, to South Georgia, 800 miles distant. After three failures, he finally succeeded in reaching the survivors of the party. Three, however, had perished. During this expedition new land, named Kaird Coast, was discovered. Shackleton was knighted in 1909. He wrote "The Heart of the Antarctic," and "The Diary of a Troopship."

SHACKLETON, ROBERT, an American writer, born at Mazomanie, Wis., in 1860. He was educated in the schools of Cleveland, Ohio, and studied law at the University of Michigan, being admitted to the bar in 1881. He was engaged in newspaper work in New York for several years and from 1900 to 1902 was associate editor of "The Saturday Evening Post." He wrote many books in collaboration with his wife on antique furniture, and also books on miscellaneous subjects. Among these are "The Great Adventurer" (1904); "The Quest of the Colonial" (1907); "Adventures in Home-Making" (1910); "The Charm of the Antique" (1914); "Touring Great Britain" (1914); "The Book of Philadelphia" (1919); "The Book of New York" (1917); "The Book of Chicago" (1920).

SHAD, the popular name of three anadromous fishes of the genus *Clupea:* (1) The allice or European shad. (2) The American shad, *C. sapidissima,* an important food fish, abundant on the At-

SHAD

lantic coast of America, and in some of the American rivers. It spawns in fresh water. Great quantities are salted. (3) The Twaite shad, *C. finta,* from 12 to 16 inches long, with 21-27 stout osseous gill-rakers on the horizontal part of the outer branchial arch. Common on the coasts of Europe, ascending rivers; abundant in the Nile. The flesh is coarser than that of the allice shad.

SHADDOCK (*Citrus decumana*), sometimes called pompelmoose, a large species of orange, attaining the diameter of seven or eight inches, with a white, thick, spongy, and bitter rind, and a red or white pulp of a sweet taste, mingled with acidity. It is a native of China and Japan, and was brought to the West Indies by a Captain Shaddock, from whom it derived its name. In the United States they are grown for the market in Florida and California. Grapefruit or pomelo is a variety of shaddock.

SHADOW. (1) Shade within defined limits; the figure of a body projected on the ground, etc., by the interception of light; obscurity or deprivation of light, apparent on a surface or plane, and representing the form of the body which intercepts the rays of light. (2) Darkness, gloom, shade, obscurity. (3) The dark part of a picture; the representation of comparative deficiency or deprivation of light; shade. (4) A reflected image, as in a mirror or water, hence, any image or portrait.

In optics, shadows are, theoretically considered, of two kinds, geometrical and physical. If a shadow be supposed to be produced by the interception of light proceeding from a single mathematical point, it will be well defined by straight lines proceeding from the point, and grazing the intervening object. But as every luminous body is possessed of some magnitude, and, therefore, emits light from many points, the shadow is not precisely defined, but consists of a portion in perfect shadow, or to which no luminous rays have access, and penumbra, to which some rays have access. In the former case the theoretical shadow is a geometric one, in the latter physical, *i. e.,* such as actually occurs in nature.

SHADWELL, THOMAS, an English dramatist; born in Stanton Hall, Norfolk, England, about 1640. His comedy "The Sullen Lovers," produced in 1668, brought him reputation. Among many other plays, he was the author of "The Virtuoso" (1676); "Lancashire Witches" (1682); "The Squire of Alsatia" (1688); and "Volunteers; or, The Stock-Jobbers" (1693). He became poet-laureate and historiographer royal in 1688, succeeding Dryden in both positions. ("Works," 4 vols. 1720.) He died Nov. 20, 1692.

SHAFROTH, JOHN FRANKLIN, a United States Senator from Colorado, born at Fayette, Mo., in 1854. He graduated from the University of Michigan in 1875 and in the following year was admitted to the bar. After practicing in Fayette, Mo., he removed to Denver. He was city attorney of that city from 1887 to 1891. In 1895 he was elected to Congress, and was re-elected until 1905. He was governor of Colorado from 1909 to 1911, and again from 1911 to 1913. In the latter year he became United States Senator, serving until 1919.

SHAFTER, WILLIAM RUFUS, an American military officer; born in Galesburg, Mich., Oct. 16, 1835; at the outbreak of the Civil War he entered the

7th Michigan Infantry as a 1st lieutenant, Aug. 22, 1861; engaged in the battles of Fair Oaks, Savage Station, Glendale, and Malvern Hill; became major of the 19th Michigan Infantry, Sept. 5, 1862; was in the action at Thompson Station, Tenn. (taken prisoner in March, 1863, and exchanged in May, 1863); became lieutenant-colonel of the 19th Michigan Infantry, June 5, 1863; colonel of the 17th United States colored troops, April

WILLIAM RUFUS SHAFTER

19, 1864; brevet brigadier-general of volunteers for gallant and meritorious services during the war; and was mustered out of the volunteer service Nov. 2, 1865. He entered the regular army and became lieutenant-colonel of the 41st Infantry, Jan. 26, 1867; assigned to the 24th Infantry, April 14, 1869; colonel of 1st Infantry, March 4, 1879; and brigadier-general May 3, 1897. On the breaking out of the Spanish-American War he was given command of the army mobilized for the invasion of Cuba; his first decisive move was the landing of 16,000 men in Cuba in about 12 hours without an accident. For details of this campaign see SPANISH-AMERICAN WAR. He commanded the Department of California in 1899-1901, and was retired June 30, 1901. He died Nov. 12, 1906.

SHAFTESBURY, ANTHONY ASHLEY COOPER, FIRST EARL OF, an English statesman; born in Wimborne, St. Giles, Dorsetshire, England, July 22, 1621. He succeeded to a baronetcy on the death of his father in 1631. After leaving Exeter College, Oxford, he studied law at Lincoln's Inn, and was chosen representative for Tewkesbury in 1640. At the commencement of the Civil War he supported the royal cause, but advised mutual concession. Finding that in consequence of this opinion he was distrusted by the court he joined the Parliament, and received command of its forces in Dorsetshire. When Cromwell turned out the Long Parliament, Sir Anthony was one of the members of the convention which succeeded, nevertheless he signed the protestation charging the Protector with arbitrary government, which did not, however, prevent him from becoming one of his privy-council. After the deposition of Richard Cromwell he aided the restoration of Charles II. with all his influence, and in 1661 was created Baron Ashley, and appointed chancellor of the exchequer and a lord of the treasury. Yet he strongly opposed the Corporation Act (1661) and the Act of Uniformity (1662), both measures favored by the crown. He afterward became a member of the obnoxious cabal. In 1672 he was created Earl of Shaftesbury and lord high chancellor. His conduct on the bench was able and impartial, but he was deprived of office, probably through the influence of the Duke of York; and he at once became one of the most powerful leaders of the opposition. For his warmth in asserting that a prorogation of 15 months amounted to a dissolution of Parliament he was confined in the Tower from February, 1677, to February, 1678. After his liberation he took a prominnent part in the attacks on Catholics during the popish-plot scare. In 1679 he became president of the council and the same year was instrumental in passing the Habeas Corpus Act. In 1681 he was indicted for high treason but acquitted. He entered into the plots of the Monmouth party and had to fly to Holland, where he died in Amsterdam, Jan. 21, 1683. He is the Achitophel of Dryden's famous satire.

SHAFTESBURY, ANTHONY ASHLEY COOPER, THIRD EARL OF, an English philosophical and moral writer, grandson of the preceding; born in Exeter House, London, England, Feb. 26, 1671. When only 11 years of age he could read Greek and Latin with ease. In 1695 he became the representative in Parliament of Poole, in Dorsetshire, and strongly supported measures favorable to public liberty. In consequence of ill health he resigned his seat in 1698, and visited Holland as a student of physic.

In 1708-1709 he published several works of a philosophical character, among others a "Letter on Enthusiasm" and an "Inquiry concerning Virtue or Merit." In 1710 his rapidly declining health led him to fix his residence at Naples. His writings were collected and published together under the title of "Characteristics of Men, Manners, Opinions, and Times." In 1716 and 1721 collections of his correspondence were published. He died in Naples, Italy, Feb. 15, 1713.

SHAG, coarse hair or nap; rough woolly hair; a kind of cloth having a long coarse nap; a kind of tobacco cut into fine shreds; a shred; roughness, coarseness; in ornithology, the *Phalacrocorax graculus*, the scart, or crested cormorant. It is smaller than the common cormorant (*P. carbo*), from which it is distinguished also by its rich dark green plumage, with purple and bronze reflections. Sexes colored alike.

SHAGREEN, a species of leather, or rather parchment, prepared without tanning, from the skins of horses, asses, and camels. Shagreen is also made of the skins of otters, seals, sharks, etc. It was formerly much used for cases for spectacles, instruments, watches, etc.

SHAH, the title given by European writers to the sovereign of Persia; in his own country he is known by the compound title Padishah. Also a chieftain or prince.

SHAHAN, THOMAS JOSEPH, an American educator; born in Manchester, N. H., Sept. 11, 1857; was educated at the American College of Rome and at the Roman Seminary; studied history at the University of Berlin in 1889-1891; and was ordained in the Roman Catholic Church in 1882. He became Professor of Church History and Patrology at the Catholic University of America in 1891. From 1905-1915 he was associate editor of the Catholic Encyclopædia. His publications include "The Blessed Virgin in the Catacombs" (1892); "Giovanni Baptista de Rossi" (1900); "The Beginnings of Christianity" (1903); "St. Patrick in History" (1905); etc., and special articles on church history and archæology in periodicals.

SHAH JEHAN, the 5th Mogul Emperor of Delhi, reigned from 1627 to 1658, when he was deposed by his son Aurungzebe. During his reign the Mogul empire attained a great magnificence; he founded Delhi, where he erected the celebrated peacock throne, valued at $32,500,000; built the Taj Mahal at Agra, a mausoleum to his favorite wife, and several other buildings which have become architecturally famous. He died in Agra, in 1666.

SHÁHJAHÁNPUR, a town in India, in the Northwest Provinces; 95 miles N. W. of Lucknow, in the executive district of the same name. There is a cantonment at the place, an American Methodist mission station with churches and schools; and sugar works in the neighborhood. Pop. about 71,000.

SHAIRP, JOHN CAMPBELL, known as PRINCIPAL SHAIRP, a Scotch poet, critic, and essayist; born in Houstoun, Linlithgowshire, Scotland, July 30, 1819. He became principal of the United College, St. Andrews. Among his works are: "Kilmahoe, a Highland Pastoral, and Other Poems" (1864); "Studies in Poetry and Philosophy" (1868); "Culture and Religion" (1870); "Poetic Interpretation of Nature" (1877); "Aspects of Poetry" (1881); and, published posthumously, "Sketches in History and Poetry" (1887); "Glen Desseray and Other Poems" (1888). He died in Ormsary, Argyllshire, Sept. 18, 1885.

SHAKERS, a name given to an American sect of celibates of both sexes, founded by Ann Lee, an English emigrant, about 1776, from their using a kind of dance in their religious exercises, but who call themselves the United Society of Believers in Christ's Second Appearing. The chief settlement is at Mount Lebanon, N. Y. There are now less than 1,000 members. Their founder was called the Elect Lady, and Mother of all the Elect, and claimed to be the woman mentioned in Rev. xii. The Shakers profess to have passed through death and the resurrection into a state of grace —the resurrection order, in which the love which leads to marriage is not allowed, and are known as brothers and sisters. They abstain from wine and pork, live on the land and shun towns. They cultivate the virtues of sobriety, prudence, and meekness, take no oaths, deprecate law, avoid contention, and repudiate war. They affect to hold communion with the dead, and believe in angels and spirits, not as a theological dogma, but as a practical fact. Their Church is based on these grand ideas: The kingdom of heaven has come, Christ has actually appeared on earth; the personal rule of God has been restored; the old law is abolished; the command to multiply has ceased; Adam's sin has been atoned; the intercourse of heaven and earth has been restored; the curse is taken away from labor; the earth, and all that is on it, will be redeemed; angels

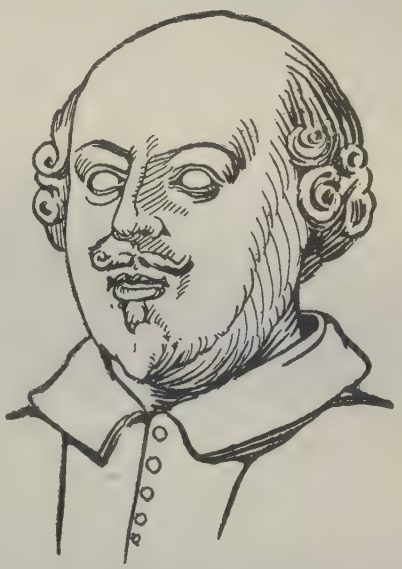
and spirits have become, as of old, the familiars and ministers of men.

The name was also applied to an English Millenarian sect founded by Mrs. Mary Anne Girling, who gave out that she was a new incarnation of the Deity, and could never die. Her followers established a community on the borders of the New Forest; but Mrs. Girling died on Sept. 18, 1886, and her followers dispersed.

SHAKESPEARE, WILLIAM (1564-1616), was the son of John Shakespeare, a dealer in agricultural products in the town of Stratford-on-Avon, in Warwickshire, England. John, at the height of his fortune, which was probably improved by his marriage with Mary Arden, the daughter of a well-to-do squire, rose to be bailiff or mayor of the town; but later he seems to have had business reverses. The birth of William was presumably a few days previous to April 26, 1564, on which day his baptism was registered in the Church of the Holy Trinity in Stratford; and this presumption is strengthened by the statement on the monument over his tomb that at his death on April 23, 1616, he was fifty-two years of age. We have no documentary evidence as to his education, but we know that there was a free grammar school in the town, and it is safe to infer that the bailiff's son would be sent to it, and would study there the usual Latin authors. There is a tradition that he left school to help his father at about the age of thirteen. When he was a little over eighteen he married Anne Hathaway, who was eight years his senior, and who bore to him a daughter, Susanna, baptized May 26, 1583, and Hamnet and Judith, twins, baptized in February, 1585.

The statement that he went to London in 1586 is only conjecture, and the stories of his acting as call-boy in a theater and holding horses at the door are uncertain traditions. We know, however, that by 1592 he had become a playwright of sufficient importance to be attacked by a rival, Robert Greene, for plagiarism. The language of Greene's attack, which occurs in Greene's "Groatsworth of Witte," implies that Shakespeare was by this time actor as well as author. Henry Chettle, who prepared Greene's book for the press, in the preface to his own "Kind-Harts Dreame," expresses regret for not having removed the offensive passages from Greene's posthumous book, and seems to refer to Shakespeare when he speaks of one of the victims of Greene's spleen as in "demeanour no lesse civill, than he exclent in the qualitie [*i. e.*, profession of acting] he professes. Besides divers of worship have reported his uprightnes of dealing, which argues his honesty, and his facetious grace in writing, that aprooves his Art."

In 1593, Shakespeare issued the first publication bearing his name, the poem "Venus and Adonis," dedicated to the Earl of Southampton. This was followed by "Lucrece" in 1594, dedicated to the same nobleman. Seven editions of the first poem and five of the second were published during the poet's lifetime, and complimentary references to them are frequent in the writing of the time. They are highly wrought re-tellings of the



WILLIAM SHAKESPEARE

familiar classical stories, vivid and sensuous in description, and fluent and melodious in style. It was through them rather than through his plays that Shakespeare achieved a literary reputation among his contemporaries.

Meantime he had become a member of the Lord Chamberlain's Company of Actors, and at Christmas, 1594, he was one of those chosen to play before Queen Elizabeth at Greenwich.

The Stratford documents again contribute to his family history with the record of the death of his son Hamnet on Aug. 11, 1596. In the same year John Shakespeare applied for a grant of arms to the College of Heralds, and a renewed application in 1599 was successful.

In 1597, the poet bought for sixty pounds, New Place, the largest house in his native town, and there is documentary evidence of a series of real estate

and other investments in Stratford and London from this time till 1615. He not infrequently engaged in lawsuits, and letters of townsmen in the Stratford archives contain allusions to him as a man of means with money to lend. The source of this money was the theater with which he was connected not only as author and actor, but also as shareholder. In 1598 two plays were issued with his name on the title page, and in the same year Francis Meres published his "Palladis Tamia," in which he speaks of the "mellifluous and honey-tongued Shakespeare" whom he compares to Ovid, Plautus, and Seneca, mentioning the two poems already described, and the titles of twelve plays. Meres is only one of many contemporaries to praise the sweetness of Shakespeare's verse, and to show by reference or quotation the growing popularity of his dramas. Writing alone, however, would never have made him a rich man. During his first decade of playwriting he turned out about two plays a year on the average, for which at current rates he would receive about £10 each, equivalent to some $400 in modern values. Prices rose later, so that in his second decade it is calculated he gained from this source about the equivalent of $1,600 a year. From what is known of the pay of actors at that time, Shakespeare would earn about £100 a year, and a single share in the theater brought in more than £200. It is therefore easy to see how a keen business man, such as the dramatist is shown to have been from the records of his lawsuits, could acquire the comfortable fortune which Shakespeare possessed at his death.

We do not know when Shakespeare withdrew from his theatrical activities in London, but there is evidence that he sold out his shares in the theater and retired to his native town several years before his death. We have records of the marriage of his daughter Susanna to a Stratford physician, John Hall, of that of Judith to Thomas Quiney, and of the burial of his mother in 1608. His father was already dead. In January, 1616, he made his will, and on April 23 of the same year died and was buried in the chancel of Stratford Church. Seven years later, two of his fellow actors, Heminge and Condell, collected his plays and published them with much prefatory laudatory matter in the famous "First Folio." About half of them had previously been issued in separate small quarto volumes.

No autograph of any of his works is preserved, but we have six authentic signatures. Our impression of his personal appearance is to be gathered from the crude bust over his grave, and the engraving prefixed to the First Folio. Numerous oil paintings have been claimed as authentic likeness, with varying degrees of evidence.

These are the main established facts with reference to the life of the greatest of English writers, and considering the status of authorship in his time, they are surprisingly numerous. In the century of his death, many of these facts appear, along with much that is merely traditional or legendary, in biographical and critical collections such as those of Fuller, Aubrey, Phillips, and Langbaine. Among the most important corroborations are the passage in "Timber" by his friend and fellow-dramatist, Ben Jonson, who makes some discriminating criticisms but protests his friendliness, "for I loved the man, and do honor his memory, on this side idolatry, as well as any"; and the splendid eulogy from the same hand in the First Folio. In the light of all this, it is hard to see how men could have doubted the identity of the author of the plays.

To the poems already mentioned are to be added his collection of sonnets. No part of his work has been subjected to so severe a scrutiny in the hope of extracting additional biographical facts. These poems are written in the first person and contain many allusions to a young friend of high station and a "dark lady," but no general agreement has been arrived at about the identity of either. Indeed, it is by no means certain that the allusions in the poems are to be taken in a strictly historical sense at all, since many of them follow conventions rife in the numerous sonnet sequences produced in the end of the sixteenth century in France and England. This search for biographical data has tended to distract attention from the high poetical value of the sonnets, their superb and concentrated diction, and their splendid imaginative passion.

Shakespeare began his career as a dramatist with collaboration, and the revision and rewriting of other men's work. The result is found in the three parts of "Henry VI.," in "Richard III.," "King John," and in "Titus Andronicus," all of which were completed by 1594. To the same period belong his first experiments in comedy, "Love's Labour's Lost," "The Comedy of Errors," and "The Two Gentlemen of Verona." Of these, the first is a light piece, full of verbal fantasies, with a good deal of social satire. The second is based upon two comedies of situation by Plautus; and the third is a romantic play, the plot of which is founded upon an incident in the Spanish novel of "Diana" by George of Montemayor. Thus in the first few years he tried his hand at all three kinds of drama,

—history, tragedy, and comedy, not hesitating to make use of what he could learn from predecessors like Marlowe, Greene, and Kyd.

The second period of his dramatic activity may be regarded as extending from 1594 to 1601, and in it he carried to the height his achievement in history and comedy. The only tragedies are "Romeo and Juliet," at the beginning of the period, and "Julius Cæsar" at the end. The former has much in common with his comedies, and in it he rises to a height of lyric fervor hardly equalled elsewhere. The latter is in comparison lacking in passion, but from the point of view of characterization, is one of his great plays.

The comedies of this period begin with the poetic "Midsummer Night's Dream" (1594-5) with its tangled love plot and abundance of delightful fancy and humor; followed by "The Merchant of Venice" (1595-6), in which the building of the plot, the drawing of the characters, and the richness of the dialogue show for the first time almost equal mastery. "The Taming of the Shrew" (1596-7), is a hilarious farce based on an older play. In "The Merry Wives of Windsor" (1598) he deals with English provincial middle-class life for the only time in his comedies, and uses as the central figure the Falstaff of the historical plays. In the three comedies written between 1599 and 1601, "Much Ado About Nothing," "As You Like It," and "Twelfth Night," English romantic comedy is found in its most brilliant and delightful form. It is hard to find in any literature so high a technical mastery of verse and characterization yielding so much imaginative and intellectual pleasure.

At the same time as these plays were being written, he carried to its highest point the chronicle history. From "Richard II." (1595) he went on to the two parts of "Henry IV." (1597-8), glorified by the scenes which gather round Sir John Falstaff, the greatest of comic creations. In "Henry V." (1599) he produced a play abounding in national spirit, and made of the King the embodiment of the English heroic ideal.

The third period is mainly occupied by tragedy. It opens with the most famous of his works, "Hamlet" (1602-3). With no abatement in constructive skill, he concentrates his power on the delineation of the prince, and gives us a picture perhaps unparalleled in its combination of subtlety and sympathetic appeal. No single work has so roused the interest of men, and about none has so much been written, with the possible exception of Goethe's "Faust." The level reached in "Hamlet" is all but maintained throughout the tragedies which followed. In "Othello" (1604) he took a sordid Italian tale and raised it to a high level of pity and terror; in "King Lear" (1605-6) the most terrible of his plays, the forces of nature form a lurid background to a spectacle of ultimate human suffering, folly, and wickedness; and in "Macbeth" (1606) a fragment of a Scottish chronicle is made to yield an appalling picture of the degradation of a human soul which surrenders to unlawful ambition. The translation of Plutarch's "Lives," which supplied material for "Julius Cæsar," was drawn on again in "Anthony and Cleopatra" (1607-8), in some respects the most amazing of his plays in its brilliance and daring and the splendor of its style, and in "Coriolanus" (1609) the somber tragedy of the downfall of a powerful leader through patrician arrogance. "Timon of Athens" (1607), from the same source, is only Shakespeare's in part, but is not lacking in passages of grandeur.

The so-called comedies of this period lack the gaiety of their predecessors. "Troilus and Cressida" (1601-2) is weighed down by a cynical humor, and "All's Well That Ends Well" (1602?) suffers from its plot, in which a capable woman pursues and wins a worthless and unworthy youth. "Measure for Measure" (1603) and "Pericles" (1607-8) both contain backgrounds of a debauched society against which are placed in relief two of the finest and purest of Shakespeare's female creations. "Pericles," like "Timon," is in part by another hand.

The fourth and last period contains an historical play, "Henry VIII." (1612), written in collaboration with John Fletcher, and three "dramatic romances," serious comedies in which crime and separation are followed by forgiveness and reunion. They lack the high spirits of the plays of the great period of comedy, but are full of noble poetry and lofty wisdom. "Cymbeline" (1610) is in plot a combination of a story from Boccaccio and a fragment of British history; "The Winter's Tale" (1611) is based on an English novel; and "The Tempest" is fabricated from elements of familiar folk-tales of princesses, magicians, and enchanted islands. This, probably the last play Shakespeare wrote alone, and his first comedy, "Love's Labour's Lost," are apparently his only dramas of which the plot is not borrowed—so careless was the greatest of English imaginative artists of mere inventive originality.

This enumeration, in the order in which modern scholarship has arranged them on a great variety of kinds of evidence as to date, gives some idea of the immense body of work of the highest class produced by Shakespeare; and gives a

basis for the study of his development as an artist. No short statement can do justice to the many-sidedness of his achievement, the musical quality of his verse, his mastery of language, the brilliance of his dialogue, the variety and profundity of his knowledge of human nature as exhibited in his characters. His work stands unsurpassed among the few greatest expressions of the genius of the race.

SHAKESPEARE-BACON CONTROVERSY, a controversy resulting from the contention that William Shakespeare (*q. v.*) did not write the plays which are attributed to him. The beginning of this controversy dates back to 1848, and since that time there have appeared a comparatively large number of books, articles, and pamphlets on the subject. Most of these, at least as far as they deny Shakespeare's authorship, attempt to prove that the real author of Shakespeare's plays was Francis Bacon (*q. v.*). The question involved has never been solved, and it is doubtful if it ever will be. There are only two principal points on which the contention, that Shakespeare did not write the plays, is based. Neither one of these points is subject to definite proof. For, while it is claimed that it is most unlikely that a country boy with as moderate an education as we know Shakespeare to have possessed, could have developed the genius and could have displayed the learning which his plays show, it is just as likely that Shakespeare should have succeeded in this as any other English boy. A second point which makes much of the fact that, as compared with Shakespeare's literary importance, we know very little regarding his life, is equally slight evidence. For the truth is that we know more about Shakespeare's life than about the life of any other Elizabethan dramatist, with the possible exception of Ben Jonson, and furthermore what we do know regarding Shakespeare's life indicates more or less clearly that the former country boy from Stratford and the author of the famous plays were one and the same. The positive evidence that Bacon wrote the plays is equally slight. The similarities which are pointed out between Shakespeare's plays and Bacon's works are chiefly phrases of common usage, and they are to be found with equal frequency in the works of many other writers than Bacon. The cryptograms, which are claimed to be secret signatures of Bacon, prove nothing, if considered with a fair amount of reason and logic. For, if they really meant what their supporters claim for them, they could be used with equal facility to prove Bacon's authorship of works which were definitely known to have been written both before and after his death. Generally speaking, the controversy has not been supported by any scholar definitely trained for literary investigation, and it is reasonably sure that the theoretical limits within which the controversy has been carried on will never be passed.

SHALE, a cod or pod; a shell; a husk; as the shale of a bean. In geology, an indurated clay, which often forms beds in the coal measures. It is chiefly composed of silica and alumina, in variable proportions, but also frequently contains a considerable amount of carbonate of lime and oxide of iron. It is of a gray or grayish-black color, or brownish-red when containing much iron. Its structure is more or less slaty. It is soft, and easily reduced to powder. It is used for making slate pencils. When free from lime and iron, it is reduced to powder, and used for making fire bricks, for which it affords an excellent material. Shale very often contains a notable quantity of bitumen and is then known as bituminous shale, and from it may be distilled an oil known as shale oil, used for illuminating purposes.

SHALER, NATHANIEL SOUTHGATE, an American geologist; born near Newport, Ky., Feb. 22, 1841. He served two years as an artillery officer in the Union army during the Civil War; was instructor in zoölogy and geology at the Lawrence Scientific School, Harvard, in 1868-1872; Professor of Palæontology in 1868-1887; then Professor of Geology; dean of Lawrence Scientific School; and after 1884 geologist in charge of Atlantic Division United States Geological Survey. Among his works are the "Kentucky Geological Reports and Memoirs" (7 vols., 1876-1882); "On the Nature of Intellectual Property and its Importance to the State" (1878); "Aspects of the Earth" (1889); "The Story of our Continent" (1892); "Nature and Man in North America" (1892); "The Interpretation of Nature" (1895); "Sea and Land" (1894); "The United States of America" (2 vols., 1893); "The Individual: Study of Life and Death" (1900); "The Citizen," "The Neighbor" (1904); "Man and the Earth" (1905); and reports of United States Geological Survey on Marine Marshes, Fresh-Water Swamps, Soils, Harbors, etc. He died in 1906.

SHALLOP, a light fishing-vessel with two masts and carrying lug or fore-and-aft sails; also a sloop or a boat for one or two rowers.

SHALLOT, a plant, the *Allium ascalonicum*, a species of garlic, the mildest cultivated. It is sufficiently hardy to en-

dure the severest winters. The shallot is used to season soups and made dishes, and makes a good addition in sauces, salads, and pickles.

SHAMANISM, a form of religion practiced in Siberia. There is no system of belief, and the only religious ceremonies consist in the Shamans working themselves into a fury, and supposing or pretending that they are inspired by the spirit in whose name they speak, and through whose inspiration they are enabled to answer questions and foretell the future.

SHAMOKIN, a borough in Northumberland co., Pa.; on the Philadelphia and Reading, and Pennsylvania railroads; 18 miles S. E. of Sunbury. It is located in the anthracite coal section. Here are electric lights, electric railroads, waterworks, National and State banks, and daily and weekly newspapers. The borough has machine shops, foundries, and a number of mines. Pop. (1910) 19,588; (1920) 21,204.

SHAMPOOING, the name given in the East Indies to a process connected with bathing, in which the whole body is pressed and kneaded by the hands of the attendants. In the United States the term is applied to the thorough cleansing of the scalp by lathering, rubbing and washing.

SHAMROCK, a ternate-leaved plant, adopted by the Irish as their national emblem. Many and warm have been the disputes to determine the veritable shamrock. Some writers contend for the *Oxalis acetosella*, or wood sorrel, the leaves of which unfold about St. Patrick's day; while others maintain that the *Trifolium repens*, or white clover, is the favored plant. Legends make out that St. Patrick, when preaching the Gospel to the benighted inhabitants of Ireland, illustrated the great doctrine of the Trinity by the triple leaf of the shamrock. Whether he plucked the bright, green leaf of the wood sorrel, or the more familiar herbage of the white clover, cannot now be determined. The latter is, however, now generally worn by Irishmen on St. Patrick's day.

SHANGHAI (shang-hī'), a city and seaport of China, in the province of Kiangsu; near the junction of the Hwang-pu and the Wu-sung rivers. The Chinese city proper is inclosed within walls 24 feet high, the streets being narrow and dirty, and the buildings low, crowded, and for the most part unimportant. In 1843 Shanghai was opened as one of the five treaty ports, and an important foreign settlement is now established (with a separate government) outside the city walls. The Wu-sung here is about ¾ mile wide, and increases to over 1 mile at its outlet into the Yang-tsze, at the port of Wu-sung. Along the bank of the river extends a wide "bund" or quay, with a bulwark of stone and numerous stone jetties, for landing and loading cargo. A municipal council is elected by the English and Americans, and another by the French, whose quarter is separately administered. The subjects and citizens of each nationality are under the protection of their respective consuls, and a complete judicial staff has been established, forming at Shanghai a supreme court, with jurisdiction over all British subjects in China and Japan. The Chinese authorities retain complete control over all shipping dues, duties on imports and exports, etc. The chief imports are cottons, yarns, woolens, kerosene, dyes, sugar, cotton machinery and metals; and the exports, hides, cotton yarn, wool, silk, tea, rice, and raw cotton. Most of the foreign trade is in the hands of British merchants. Pop. (1918) 1,000,000.

SHANHAIKWAN, a town of the province of Chihli, China. It has fortifications and is situated at the E. end of the Great Wall, on the Gulf of Pechili. It is divided into three different quarters by thick walls, the three quarters being inclosed by another wall. Business is transacted in the central town, the others being given over to officials and residents. Pop. about 38,000.

SHANKLIN, WILLIAM ARNOLD, an American educator, born at Carrollton, Mo., in 1862. He graduated from Hamilton College, in 1883, and afterward studied at the Garrett Biblical Institute. He was ordained to the Methodist Episcopal ministry in 1889, and served as pastor in churches in Kansas, Washington, Iowa, and Pennsylvania. From 1905 to 1909 he was president of the Upper Iowa University, and in the latter year was chosen president of Wesleyan University.

SHANNON, a large river in the W. of Ireland, and one of the finest in the British Islands. It has a length of 220 miles, and is divided into the Upper and Lower Shannon. The Upper Shannon, by far the longest and narrowest part of the river, rises in the mountains of Ulster, at the N. W. extremity of the county of Cavan from the Cuilcagh Mountains, and flowing S. enters and passes through Lough Allen, till, quitting the county of Leitrim, it flows S. and E. and S. W. to the town of Banagher, forming from this portion of its course the boundary between Connaught and Leinster. From

Banagher the river has first a S. W. and then a S. course, till, a little above the city of Limerick, it divides into two branches, which, flowing round King's Island, the most ancient part of the city, unite below to form the Lower Shannon. From its rise in Cavan to its encircling the King's Island, the river has a length of 180 miles. In this course the river is greatly interrupted by shallows, falls, and rocks. The Lower Shannon, from Limerick to the mouth of its estuary in the Atlantic, has a length of 40 miles and a breadth of from 1 to 7 miles; though the channel in places is obstructed by islands, rocks, and shoals. It has, however, good anchorage everywhere, and forms a harbor of refuge for ships against the force of W. gales.

SHANNY, or **SHAN**, a fish, the *Blennius pholius*, sometimes called the smooth blenny. It is about four inches long, olive-green, with irregular black spots. There is no crest-like appendage on the head, and the notched dorsal is not continuous with the caudal fin. The incisors are long, and serve to detach limpets and mussels from the rocks. The shanny will endure fresh water for a short time, and will live for many days out of water in places if the ground is moist.

SHANSI, an inland province of northern China; area, 81,830 square miles; pop. about 10,000,000. It is the original seat of the Chinese people, and in its lowland parts is well cultivated. The rivers, which are almost all tributaries of the Yellow river, are numerous, but not large. The chief grain crops are wheat and millet, and there are coal, iron, copper, and other minerals. Capital, Tai-yuen-foo.

SHAN STATES, a number of tributary States in Indo-China, between Munnipur on the W. and Yunnan on the E., and from the parallel of lat. 24° N. S. to Bangkok and Cambodia. Of these the Northern States are tributary to Burma, and the Southern to Siam. A great portion of the mountainous region of these States is called the Laos Country, and is inhabited toward the N. by the Black-bellies, so called from the circumstance that they tattoo themselves with figures in ink, and in the S. by the White-bellies, who do not tattoo. Xiengmai, the capital of Laos, stands on a wide plain on the Meinam, 500 miles N. of Bangkok, and is said to contain 50,000 inhabitants. The number of Laocians included in Siam alone is estimated at 1,000,000. They are meek, gentle, unwarlike, and superstitious. Their chief employment is agriculture; and in religion they are Buddhists.

SHANTUNG, a maritime province of China; on the Yellow Sea; area, 55,970 square miles; pop. 25,810,000. The chief river is the Yellow river, which, after traversing the province in a N. E. direction, flows into the Gulf of Peh-chih-li. Wheat, millet, and indigo are the chief products, and the manufactures include silk, hempen cloths, felt, etc. It was in this province that Confucius was born. This province contains the important harbors of Chefoo and Wei-hai-wei. See CHINA.

SHAPINSHAY, one of the Orkney Islands of Scotland, between the islands of Stronsay and Pomona. It is about 4½ miles long and 4 miles broad; area, 6,733 acres, of which nine-tenths are under cultivation, and yield excellent crops of grain. The surface is generally flat, but at one point rises to the height of 162 feet.

SHARI, a large river in Central Africa, which enters the S. side of Lake Tchad by several mouths after a course of about 1,400 miles from the S. E. See TCHAD, LAKE.

SHARK, an English popular name for any individual of the group *Selachoidei*. The body is generally elongated; the muzzle, on the under side of which the nostrils are placed, projects over the

BLUE SHARK

mouth, and the males have claspers (with the function of intermittent organs) attached to the ventral fins. The ova are large and few in number, impregnated, and in some genera developed, within an uterine cavity; in others deposited in a tough, horny case, from which the young fish, carrying a yolk-bag, for its nourishment till it is able to seek food, is discharged; in this stage the gill-laminæ are prolonged into filaments projecting beyond the gill-cavities, but these are soon absorbed. The teeth are generally large,

sharp, and formed for cutting, often with serrated edges, but in some genera they form a solid pavement-like mass. Sharks are scaleless, and the skin is usually very rough (see SHAGREEN). They are most numerous in tropical seas. The larger sharks are exclusively carnivorous, and some of them extremely dangerous to man. The smaller sharks are popularly

HAMMERHEAD SHARK

known as dog fishes or hounds, and do great damage to fishermen's lines and nets. The flesh of sharks is coarse, but it is sometimes eaten; the Chinese use sharks' fins for making thick gelatinous soups, and the liver yields an oil. The rough skin is employed by joiners to polish fine-grained wood, and by cutlers to cover the hilts of swords to make them firmer in the grasp. Figurately, a greedy, artful fellow; one who fills his pocket by sly tricks.

SHARON, a borough of Pennsylvania, in Mercer co. It is on the Shenango river, and on the Pennsylvania, the Lake Shore, and Michigan Southern, the Pittsburgh and Lake Erie, and the Erie railroads. It is the center of an important steel and iron industry, and has rolling mills, furnaces, boiler shops, ordnance works, and manufactures of explosives, nails, chains, stoves, and lumber products. It has also important coal mining interests. Pop. (1910) 15,270; (1920) 21,747.

SHARP, a part of a stream where the current runs very rapidly; as, sharps and eddies. In music, a sign, which, when prefixed to a note, elevates it by a semitone in the scale. When placed at the beginning of a piece of music, it denotes that all the notes on the line or space on which it is placed, and their octaves above and below, are to be played sharp. A double sharp × raises a note two semitones. To brace sharp, in nautical language to brace the yards as obliquely as possible, in order to bring a ship well up to the wind.

SHARP, DALLAS LORE, an American writer and educator, born at Haleyville, N. J., in 1870. He graduated from Brown University, in 1895, and studied theology at the Boston University. He was ordained to the Methodist Episcopal ministry in 1895, and served as pastor of a church in Massachusetts until 1899, when he was appointed assistant librarian of the Boston University. In 1902 he became assistant professor of English at that institute, and full professor in 1909. His books and articles on nature subjects obtained a wide popularity. They include "Wild Life Near Home" (1901); "The Face of the Fields" (1911); "Winter" (1912); "Beyond the Pasture Bars" (1913); "The Hills of Hingham" (1916).

SHARP, ELIZABETH AMELIA (Mrs. William Sharp), an English art critic, born at London in 1856. She was educated privately and at University College, London, and in 1884 married the late William Sharp (Fiona Macleod). Her works include: "Women Poets"; "Sea-Music"; "Heine's Italian Travel Sketches"; "Heine's Art and Letters"; "Lyra Celtica, an Anthology of the Poetry of the Celt"; "A Monograph on Rembrandt"; "William Sharp, a Memoir"; "Collected Writings of Fiona Macleod" (7 vols.); "Selected Writings of William Sharp" (5 vols.).

SHARP, ROBERT, an American educator, born at Lawrenceville, Va., in 1851. He graduated from the Randolph-Macon College, in 1876, and took post-graduate studies at the University of Leipzig. He was professor of English at the University of Louisiana from 1880 to 1884, and from 1884 to 1913 at Tulane University of Louisiana. From that year to 1918 he was president of the latter institution, and president emeritus from October, 1918. He edited several old English texts and wrote on Anglo-Saxon literature.

SHARP, WILLIAM, a British critic and man of letters; born in Renfrewshire, Scotland, Sept. 12, 1856; was educated at Glasgow University. He traveled extensively, and contributed to leading publications throughout the world. His works include "Humanity and Man," a poem; "The Conqueror's Dream, and Other Poems"; "Dante Gabriel Rossetti," a biography; "Shakespeare's Songs, Poems and Sonnets"; "Sonnets of this Century"; "Shelley," a biography; "Romantic Ballads"; "Lyrical Poems" (1899); in fiction, "Children of Tomorrow," etc. He also wrote under the name of FIONA MACLEOD, (*q. v.*). He died Dec. 14, 1905.

SHARP, WILLIAM GRAVES, an American diplomatist, born at Mt. Gilead, Ohio, in 1859. He graduated from the Law Department of the University of Michigan, in 1881, and for several years practiced law at Elyria, Ohio. From 1885 to 1888 he was prosecuting attorney of Lorain co., Ohio. He was active in politics and was a delegate to several Democratic conventions. In 1909 he was elected to Congress, and was re-elected successively until 1914, when he resigned on his appointment as ambassador to France. He served in this capacity from December, 1914, to April, 1919.

SHARPE, HENRY GRANVILLE, an American soldier, born at Kingston, N. Y., in 1858. He graduated from the United States Military Academy in 1880, and was appointed 2nd lieutenant in the same year. He resigned in 1882, but was reappointed as a captain in 1883. He was promoted major in 1895, colonel in 1901, and commissary-general in 1905. In 1912 he was made brigadier general in the Quartermaster Corps, and in 1916 was made major-general and quartermaster general. In 1918 he became major general of the line of the army. He superintended relief work during several floods in the south, and had charge of the commissary of the 1st Army Corps, and of the Department of Porto Rico during the Spanish-American War. He was chief commissary of the Philippines from 1902 to 1904, and in 1918-19 commanded the Southeastern Department. He served in France in the latter year. He was the author of "The Art of Subsisting Armies in War," and "The Provisioning of the Modern Army in the Field."

SHARPSBURG, a borough in Allegheny co., Pa.; on the Allegheny river, and on the Pennsylvania and the Pittsburgh, Cincinnati, Chicago and St. Louis railroads; 5 miles N. E. of Pittsburgh. Here are public and private schools, banks, and a number of weekly newspapers. The borough contains numerous coal mines, foundries and iron furnaces. Pop. (1910) 8,153; (1920) 8,921.

SHASTA, MOUNT, a peak of volcanic origin in Siskiyou co., Cal., at the N. end of the Sierra Nevada, 14,350 feet above sea-level. On its summit are three glaciers, one of which, the Whitney glacier, is 3 miles long. On its slopes are some gigantic trees over 300 feet high. The mountain is almost a perfect cone, and is a dormant volcano.

SHASTER, or **SHASTRA**, in Brahmanism, that by which faith and practice are governed, an institute of letters, law, or religion considered as of divine authority. Used of the Vedas and other books of the Brahmanic scriptures.

SHAUGHNESSY, THOMAS GEORGE, 1st Baron, born at Milwaukee, Wis., in 1853. He was educated in the Catholic public schools and in 1882 became general

THOMAS GEORGE SHAUGHNESSY

purchasing agent on the Canadian Pacific railway, subsequently becoming assistant general manager and president. He was also president and director of a number of railway companies, all of which were directly or indirectly con-

nected with the Canadian Pacific railway. In 1901 he was knighted and in 1907 was made a baron.

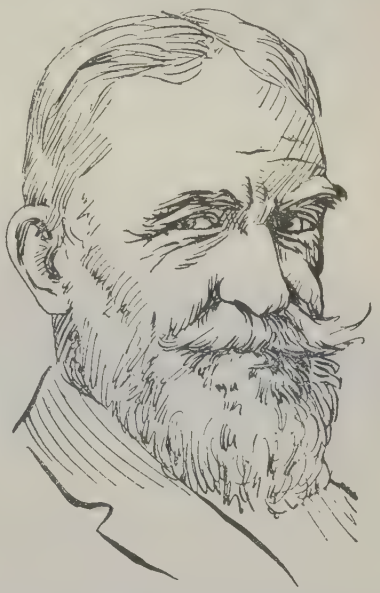
SHAW, ALBERT, an American editor; born in Shandon, Butler co., Ohio, July 23, 1857; was educated at Iowa College and Johns Hopkins University. After 1891 he was the editor of the American "Review of Reviews." Included in his publications are: "Icaria: a Chapter in the History of Communism" (1884); "Co-operation in a Western City" (1886); "The National Revenue" (1888); "Municipal Government in Great Britain"; "Municipal Government in Continental Europe"; "Outlook of the Average Man" (1907); "Cartoon History of Roosevelt's Career" (1910), etc.

SHAW, ANNA HOWARD, an American woman suffragist and publicist, born in Newcastle-on-Tyne, England, in 1847. She was brought to the United States in her childhood and graduated from the Boston Theological School, in 1878. She was ordained to the Methodist ministry, but was not allowed to preach on account

ANNA HOWARD SHAW

of her sex, and in 1880 she was ordained by the Methodist Protestant Church, being the first woman ordained in that body. She became active as a suffrage lecturer in 1885, and continued to lecture on behalf of the movement for the remainder of her life. From 1904 to 1915 she was president of the National American Woman Suffrage Association, and from 1915 was honorary president. She was one of the most brilliant and effective of American workers for suffrage. She wrote "The Story of a Pioneer." She died in 1919.

SHAW, GEORGE BERNARD, a British playwright, born in Dublin, Ireland, in 1856. He attended school until he was fifteen, when he became a clerk in a real estate office, which position he held for five years, until he left his native city to seek a career as a journalist in London. For more than ten years he gained a



GEORGE BERNARD SHAW

precarious livelihood as a "free lance" journalist, meanwhile devoting his spare time to writing novels. Most of these early works were published serially in Socialist papers and magazines, and attracted little general attention. Among them are "Cashel Byron's Profession" (in book form, 1886); "An Unsocial Socialist" (1899); and "Love Among the Artists" (1900). In 1885 Shaw became dramatic critic of the "Pall Mall Gazette" and, later, of "The Saturday Review," and began immediately to attract public attention by his masterly reviews. From this first association with the stage, he began to write plays himself, the first few of which were produced and gained him considerable reputation, but did not prove financially successful. Among these were "Widowers' Houses" (produced at the Independent Theater, 1892); and "Arms and the Man" (1894). The turning point in his favor came in 1904, when

his "John Bull's Other Island" was produced and immediately became popular. Many of his plays have been presented in this country and have been appreciated by select audiences, but Shaw's plays are of too subtle a style ever to attain broad popularity. He has also been prominent as a Socialist speaker and was one of the founders of the Fabian Society. During the World War Shaw showed himself strongly in favor of the Allied cause, but at the same time his scathing denouncement of many of the inefficiencies at home made him strongly disliked by those who believed that war-time was no time for criticism. Among his most recent plays are: "The Inca of Perusalem" (1915); "Heartbreak House" (1917); and "O'Flaherty V. C." (1919).

SHAW, HENRY WHEELER, an American humorist; born in Lanesborough, Mass., April 21, 1818; early went West and tried his hand at various occupations, working on a steamboat on the Ohio river, farming, and engaging in auctioneering. In 1859 he began to write and in 1860 sent "An Essa on the Muel, bi Josh Billings" to a New York paper. It was extensively copied. His most successful literary venture, however, was a travesty on the "Old Farmer's Almanac," 127,000 copies of which were sold in its second year. He began to lecture in 1863, and for 20 years previous to his death contributed regularly to the New York "World." He also published "Josh Billings, His Sayings," "Josh Billings On Ice," "Everyboddy's Friend," "Josh Billing's Spice Box," etc. He died in Monterey, Cal., Oct. 14, 1885.

SHAW, JOHN, an American naval officer; born in Mount Mellick, Ireland, in 1773; removed to Philadelphia, Pa., in 1790; and received employment on a merchant vessel. When war with France became probable, he joined the United States navy as a lieutenant; and was placed in command of the schooner "Enterprise" in December, 1799. During an eight months' cruise with this vessel he engaged in five severe actions, recaptured 11 American prizes and took 5 French privateers. His most severe battle occurred with the "Flambeau," a vessel of 100 men and 14 guns. He forced her to surrender in less than an hour after about 50 of her crew were either killed or wounded, while the loss to the "Enterprise" was 10. He was promoted captain in August, 1807, and commanded the fleet which was blockaded by the British in the Thames river in 1814. He died in Philadelphia, Pa., Sept. 17, 1823.

SHAW, JOHN BALCOM, an American educator, born at Bellport, N. Y., in 1860. He graduated from Lafayette College in 1885, and from the Union Theological Seminary in 1888. In the same year he was ordained to the Presbyterian ministry and was pastor of the West End Church, from 1888 to 1904, and of the Second Church of Chicago, from 1904 to 1913. From the latter year to 1915 he was pastor of Immanuel Church, Los Angeles. In 1915 he was elected president of Elmira College for Women, serving until 1917. He contributed extensively to magazines and religious papers, and wrote "Four Great Questions" (1898); "One Step at a Time" (1904); "The Work That Wins" (1905); "The Angel in the Sun." He was a delegate to many international meetings and conventions.

SHAW, JOHN WILLIAM, an American Roman Catholic archbishop, born in Mobile, Ala., in 1863. He was educated at the Academy of the Brothers of the Sacred Heart, in Mobile, and took postgraduate studies in Ireland and in Rome. He was ordained priest in 1888. After serving as missionary in Montgomery, Ala., he became rector of the Cathedral of Mobile, and chancellor of the diocese, in 1891. In 1910, he was appointed coadjutor bishop of San Antonio, Tex., and became bishop of San Antonio in 1911. In 1918 he became archbishop of New Orleans.

SHAW, LEMUEL, an American jurist; born in Barnstable, Mass., Jan. 9, 1781; was graduated at Harvard University in 1800 and was admitted to the bar in 1804. He followed his profession in Boston, Mass., where he attained eminence; was a member of the State Senate in 1821-1822 and 1828-1829; and chief-justice of the Massachusetts Supreme Court in 1830-1860. He won a high reputation as a jurist of marked ability, being accorded a foremost place among the greatest New England jurists. Among the most noted cases at which he presided was that of Prof. John W. Webster for the murder of Dr. George Parkman and that of the convent rioters in 1834. His publications include "Fourth of July Oration" (1815); "Inaugural Address" (1830); and "Addresses at the Opening of the New Court House, Worcester" (1845). He died in Boston, Mass., March 30, 1861.

SHAW, LESLIE MORTIER, an American statesman; born in Morristown, Vt., Nov. 2, 1848; was graduated at Cornell College, Mt. Vernon, Ia., in 1874, and at the Iowa College of Law in 1876, and in the latter year began the practice of law in Denison, Ia. Some years later he became interested in banking and was made president of the Bank of Denison

and also of the Bank of Manilla, Ia. He first became prominent in politics in 1896, where he came out strongly for William McKinley, and soon acquired a high reputation as a public speaker. He was elected governor of Iowa for the terms of 1898-1900 and 1900-1902; and was chairman of the International Monetary Conference in Indianapolis, Ind., in 1898. He resigned the office of governor in 1902 to succeed Lyman J. Gage as Secretary of the United States Treasury Department. He retired in 1913, to engage in the banking business.

SHAW UNIVERSITY, a coëducational institution in Raleigh, N. C., for colored students; founded in 1865 under the auspices of the Baptist Church; reported at the close of 1919: Professors and instructors, 23; students, 464; president, Charles F. Meserve, LL. D.

SHAWL, a garment of high antiquity. Even the elaborately wrought and beautiful shawls of India and Persia have been continuously made from an early time. Kashmere shawls are made of a very fine material called *pashm* or *pashmina*, consisting of the inner or underwool of the shawl goat of Tibet.

At Paisley in Scotland, for many years previous to 1860 the manufacture of shawls was of great importance. They were made of silk, wool, or cotton, either separately or in combination; but the best-known class of Paisley shawls was manufactured of fine wool and with patterns in the style of those woven in Kashmere. Soon after the middle of the century, however, the manufacture began to decline. Tartan shawls are still made at several places in Scotland. Shawls are now manufactured in most European countries, in the United States and the East.

SHAWNEE, a city of Oklahoma, in Pottawatomie co. It is on the Atchison, Topeka, and Santa Fé, the Chicago, Rock Island, and Pacific, and the Missouri, Kansas, and Texas railroads. It has railroad shops, cotton gins, oil mills, etc. It is the seat of the Baptist University and the Catholic University. Pop. (1910) 12,474; (1920) 15,348.

SHAWNEE INDIANS, a tribe of American Indians of the Algonquin family, formerly settled mainly in New York, Pennsylvania, and Ohio, but driven W. by the Iroquois. They helped the French against the English, gave trouble to the newly-founded United States, and in 1812 some bands joined the English. They afterward removed to Missouri, Kansas, and Indian Territory.

SHAYS, DANIEL, an American insurgent; born in Hopkinton, Mass., in 1747; served as ensign at the battle of Bunker Hill, and attained the rank of captain in the Continental army. He took a leading part in the popular movement in western Massachusetts for the redress of alleged grievances, appearing before Springfield, Mass., at the head of 1,000 men to prevent the session of the Supreme Court at that place, and commanding the rebel party at Pellham and at the engagement with the militia at Petersham. After the rebellion was put down, however, he was pardoned by the government and later, in his old age, was allowed a pension for his services during the Revolutionary War. He died in Sparta, N. Y., Sept. 29, 1825.

SHEA, the *Bassia butyracea* of botanists, is a native of tropical Asia and Africa. The trunk of this tree, when pierced, yields a copious milky juice, and *shea* or vegetable butter is found in the nuts when crushed.

SHEARTAILS (*Thaumastura*), a genus of humming birds, of which the slender sheartail (*T. enicura*) and Cora's sheartail (*T. Cora*) are two familiar species. These birds occur, the former in Central America generally; the latter in Peru and in the Andes valleys. They derive their name from the elongation of the two central tail feathers of the males.

SHEARWATER, the name of several marine birds of the genus *Puffinus*. The greater shearwater (*P. cinereus*), which is 18 inches long, is found on the S. W.

GREATER SHEARWATER

coasts of England and Wales. They fly rapidly, skimming over the sea, from which they pick up small fishes, mollusks, etc. The name is sometimes applied to the scissor-bill or skimmer (*Rhynchops nigra*).

SHEATFISH, a name applied to any fish of the family *Siluridæ*, but specifically to *Silurus glanis*, called also the sly silurus, with the exception of the sturgeon, the largest European freshwater fish. It is allied to the catfish. It is common in Germany, Poland, Styria, the Danube, and the rivers of southern Russia. It attains a weight of from 300 to 400 pounds, and the flesh of the young fish is well-flavored. The fat is used in dressing leather, and the air bladder is made into gelatine.

SHEATH BILL, in ornithology, the genus *Chionis*, made known by the naturalists of Cook's second voyage, a specimen of *C. alba* having been met with on New Year Island, on Dec. 31, 1774. It resembles a pigeon in size and general appearance; plumage pure white; bill yellow at base, passing into pink at tip; round the eyes the skin is bare, and dotted with cream-colored papillæ; legs bluish-gray. In the Falkland Islands it is called the kelp pigeon. Another species was discriminated in 1842 by Dr. Hartlaub; it is smaller than *C. alba*, with similar plumage, but having the bill and bare skin of the face black and the legs much darker. The sealers of Kerguelen Land call it the sore-eyed pigeon, from its prominent fleshy orbit.

SHEATHING, that which sheathes or covers; specifically, in shipbuilding, a covering, usually thin plates of copper or an alloy containing copper, to protect the bottom of a wooden ship from worms.

SHEAVE, the grooved wheel in the shell of a block or pulley over which the rope runs. In wooden blocks, it is generally of lignum vitæ, and has a brass bushing, called a coak, which runs on the pin. In locksmithing, a sliding scutcheon for covering a keyhole.

SHEBA, in ancient geography, a kingdom of South Arabia, embracing the greater part of Arabia Felix; named after Sheba, one of the sons of Jokshan, second son of Abraham and Keturah (Gen. xxv. 3-4). The Queen of Sheba visited Solomon, 990 B. C. (I Kings x. 1-13). The Greeks and Romans called the people Sabæi, or Sabæans.

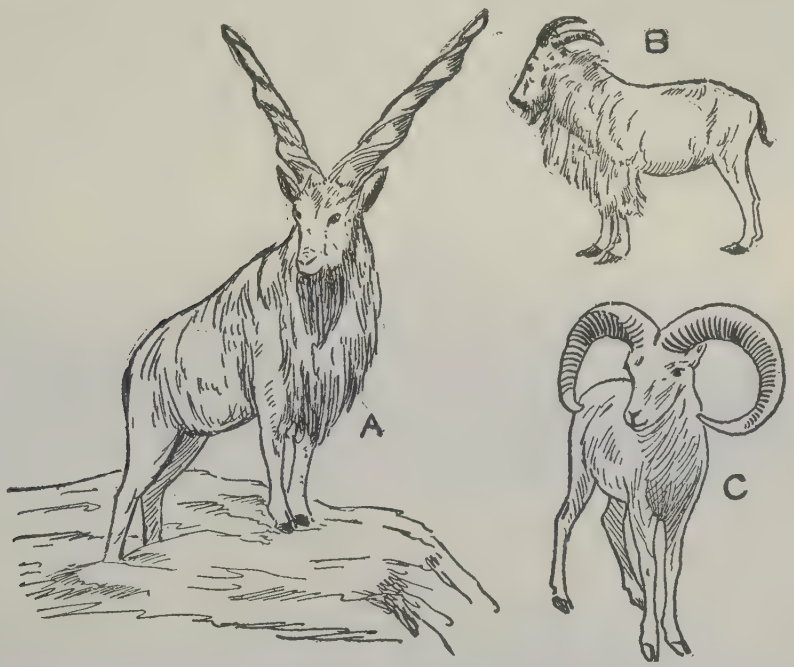
SHEBOYGAN, a city and county-seat of Sheboygan co., Wis.; on Lake Michigan at the mouth of the Sheboygan river, and on the Chicago and Northwestern railroad; 52 miles N. of Milwaukee. Here are a United States Government building, an Asylum for the Chronic Insane, Home for the Friendless, St. Nicholas Hospital, State Fish Hatchery, public library, waterworks, street railroad and electric light plants, and several daily and weekly newspapers. It is the shipping point for an extensive dairying and agricultural region. Sheboygan is chiefly noted for its manufacture of chairs. Besides this industry it has stamped steel and cast-iron works, and manufactories of furniture, soap, boilers, bicycles, leather, pianos, beehives, boots and shoes, carriages and wagons, and bricks and tiles. Pop. (1910) 26,398; (1920) 30,955.

SHEEHAN, PATRICK AUGUSTINE, an Irish Roman Catholic clergyman and novelist, born at Mallow, County Cork, in 1852. He was educated at St. Colman's College and at Maynooth. He was pastor of Roman Catholic churches in several cities in England and Ireland, up to 1903, when he became canon of Cloyne. He was a prolific writer in all lines of literature, but is best known as a novelist. His books afford graphic pictures of Irish life and character. They include "My New Curate" (1899); "Parerga" (1908); "Miriam Lucas" (1912); "Graves at Kilmorna" (1915). The latter book was published after his death, which occurred in 1913.

SHEEHAN, PERLEY POORE, an American editor and writer, born in Cincinnati, Ohio, in 1875. He graduated from Union College in 1898, and engaged in newspaper work in New York, London, and Paris, until 1908. He was in charge of the Paris edition of the "New York Herald," from 1905 to 1907, and from 1908 to 1910 was associate editor of the Munsey publications. He wrote "The Seer" (1913); "Those Who Walk in Darkness" (1915); "If You Believe It, It's So" (1919). He also collaborated in the writing of several plays.

SHEEP, the common name of the genus *Ovis*, belonging to the *Cavicornia*, or hollow-horned ruminant family. Naturalists are by no means agreed as to what was the original breed of this invaluable animal. Of the several varieties of wild sheep which have by naturalists been considered entitled to the distinction of being the parent stock, may be mentioned: (1) the Musmon (*O. musmon*), still found wild in the mountains of the larger islands of the Mediterranean and European Turkey; (2) the Argali (*O. ammon*), or wild Asiatic sheep, which are the tenants of the highest mountains of Central Asia, and the elevated, inhospitable plains of its N. portions; (3) the Rocky Mountain sheep (*O. montana*), which is found on the mountains of North America; (4) the bearded sheep of Africa (*O. tragelopleus*), found on the high lands of Egypt and in Barbary. The leading fact in the geographical history of this genus is that it occurs both in

the New and the Old World, whereas the goat tribe are naturally unknown in America. It is usually regarded by naturalists as being not only specifically, but generically, distinguished from the goat tribe; but some authorities, on the other hand, are inclined to believe that the generic separation is founded chiefly on characters which have arisen from the



WILD SHEEP

A. Markhor. B. Blanford Sheep. C. Barbary Sheep.

influential power of man. In a state of nature, the sheep is scarcely less active or energetic than the goat.

The main characteristics of the four unsubdued races of sheep mentioned above are as follows: The Musmon measures about three feet and a half in length, and its height, at the highest part of the back, is about two feet six inches. The neck is large, the body thick, muscular, and of a rounded form. The horns of the male are nearly two feet long. The body is protected by a short, fine, gray-colored wool, of which the filaments are spirally twisted, and by a stiffish silky hair, sufficient to conceal the wool beneath. It is gregarious in a state of nature, and seldom descends from the highly-elevated portions of the mountains on which it dwells. The general opinion of naturalists is that it is from this species the domestic breeds have been obtained. The bearded sheep of Africa has the hair on the lower part of the cheeks and upper jaws extremely long, so that it forms a double or divided beard. The hairs on the sides and body are short, those on the top of the neck somewhat longer, and rather erect. The whole under-parts of the neck and shoulders are covered by coarse hair.

The Argali, or wild sheep of Asia, measures about three feet in height at the shoulder, and five feet in length. His horns are nearly four feet long, and placed on the summit of the head, so as to cover the occiput. They nearly touch each other in front, bending backward and laterally, and then forward and outward. The female is of smaller size, and her horns are nearly straight. The *Ovis montana*, or Rocky Mountain sheep of the United States, is larger than the largest varieties of domestic breeds. The horns of the male are of great dimensions. The hair in this species resembles that of a deer.

The many varieties of sheep which tenant Great Britain and Ireland may be

conveniently divided into two classes; the first consisting of sheep without horns, and the second of sheep with horns. Of the first class are, the New Leicester sheep, the characteristics of which are fineness and fullness of form, an early maturity and propensity to fatten; the wool, not so long as in some breeds, but considerably finer. The Cotswold sheep, which have been long celebrated for the fineness of their wool, and which have been gradually improved by crossing with the Leicester sheep. Their mutton is fine-grained and full-sized. The Dartmoor sheep, which have white faces and legs, some with and some without horns, small in the head and neck, and generally small-boned, carcass narrow and flat-sided. The Southdown sheep have short wool, close and curled. The flesh is highly esteemed. The Romney-Marsh sheep have long but coarse wool, much internal fat, and much hardihood, and require no artificial food during the hardest winter but a little hay. The Cheviot sheep are a peculiar breed, which are kept on the extensive range of the Cheviot hills. They have the face and legs generally white, and the body long; their wool is short, thick, and fine; they possess very considerable fattening qualities, and can endure much hardship both from starvation and cold. Of the horned sheep, the chief varieties are: The Dorset sheep. They are a good folding sheep, and their mutton is well flavored, but their principal distinction and value is the forwardness of the ewes, who take the ram at a much earlier period of the year than any other species, and thus supply the market with lamb at the time when it fetches the highest price. The Shetland sheep are small and handsome; hornless, hardy, feeding on even sea-weed, and with soft and cottony wool. The Hebridean sheep is the smallest of its kind, even when fat weighing only 20 pounds.

The most important breed of sheep as regards the texture of the wool is the Merino (*O. hispanica*). The wool is fine, long, soft, twisted, in silky spiral ringlets, and naturally so oily that the fleece looks dingy and unclean from the dust outside, but is perfectly white underneath. They readily form cross breeds, called demi-merinos, which have been brought to great perfection in France, whence, as well as from Spain, they have been imported into the United States. Of the other remarkable varieties of the genus *Ovis* in different parts of the world, we may mention the fat-tailed sheep, common in Tartary, Arabia, Persia, and Egypt, the tail of which is so loaded with fat that it alone frequently weighs 20 pounds. The many-horned sheep of Iceland, and the most northern part of the Russian dominions, has three, four, or five horns, sometimes placed with great regularity, and sometimes differing in proportion and situation. The Cretan sheep, chiefly found in the island of Crete, are kept in many parts of Europe on account of the strangeness of the appearance of its horns, which are remarkably large, long, and spiral; the fat-rumped tailless sheep are met with in all the deserts of Tartary; the African or Guinea sheep, a native of all the tropical climates, both of Africa and the East. Different names are given to the sheep, according to its sex and age. The male is called a ram or tup. After weaning, he is said to be a hog, hogget, or hoggerel, a lamb-hog, or tup hog or teg; and if castrated, a wether-hog. After shearing, he is called a shear-hog, or shearing, or dimmort, or tup. After the second shearing, he is a two-shear ram; and so on. The female is a ewe or gimmer-lamb till weaned, and then a gimmer, or ewe-hog, or teg. After being shorn, she is a shearing-ewe or gimmen, or theave, or double-toothed ewe; and after that a two-, or three-, or four-shear ewe or theave. The age of the sheep is reckoned, not from the period of their being dropped, but from the first shearing. The total number of sheep in the United States on Jan. 1, 1920, was 48,615,000.

Black sheep is a figurative term to denote a person who is, as it were, outlawed from society, by reason of his misdeeds or moral obliquities.

SHEEP TICK, a well-known dipterous insect (*Melophagus ovinus*) belonging to the family *Hippoboscidæ* or horse flies. The pupæ produced from the eggs are shining oval bodies which become attached to the wool of the sheep. From these issue the tick, which is horny, bristly, of a rusty ochre color, and wingless. It fixes its head in the skin of the sheep and extracts the blood, leaving a large round tumor. Called also sheep louse.

SHEERNESS, a seaport and royal dockyard in Kent, England; 52 miles E. of London; occupies the N. W. angle of the Isle of Sheppey, and thus commands the mouths of the Thames and Medway. It consists of the four divisions of Blue Town, Mile Town, Westminster, and Marine Town, the last of which has become a favorite watering-place, while the first contains the dockyard and is strongly fortified. Sheerness has two churches, a Roman Catholic chapel (1864), and large naval and military barracks. The dockyard, covering 60 acres, comprises wet and dry docks. Captured by the Dutch under De Ruyter in 1667, Sheerness was shortly after fortified, but the dockyard

was not commenced till 1814, since which time large sums have been expended on its construction. Pop. about 18,000.

SHEFFIELD, a city of Alabama, in Colbert co. It is on the Tennessee river, and on the Louisville and Nashville, the Northern Alabama, and the Southern railroads. Its important industries include iron products and lumbering. There are also extensive coal mines in the neighborhood, and the farming interests are quite important. Pop. (1910) 4,865; (1920) 6,682.

SHEFFIELD, a municipal and parliamentary borough of England, county of York (West Riding); on hilly ground at the junction of the Sheaf and Don, about 160 miles N. of London. The site of the town was originally confined to the angle formed by the Sheaf and Don, but it now extends along the slopes above these rivers and their tributaries, the Loxley, Rivelin, and Porter. In the central parts great improvements have been made in the crowded streets by the corporation, and the suburban districts are well built and picturesquely situated. The chief ecclesiastical building is the ancient parish church of St. Peter's in the Perpendicular style. There are numerous educational and literary institutions, and the St. George's Museum founded by Mr. Ruskin. The principal buildings are the town hall, the Cutlers' Hall, the corn exchange, the music hall, and the Albert Hall. There are numerous hospitals and charitable institutions. The town is well supplied with parks, chief of these being the Norfolk, Birth, and Weston parks, the latter of which includes a museum and the Mappin Art Gallery. The trade of Sheffield is chiefly connected with cutlery, for which it has long been famous, and the manufacture of all forms of steel, iron, and brass work. The steel manufacture includes armor plating, rails, engine castings, rifles, etc. There are also manufactures of engines, machinery, plated goods, Britannia metal goods, optical instruments, stoves and grates, etc. Sheffield is supposed to have been originally a Roman station. Edward I. granted it a charter as a market town in 1296, and there is indication in Chaucer's writings that the town was then noted for its cutlery. But it was only after the beginning of the 19th century that it developed such importance as a manufacturing center. The chief modern event in its history was the terrible disaster in 1864, occasioned by the bursting of Bradfield Reservoir. Pop. (1919) 473,695.

SHEIK, or **SHEIKH** (Arabian), an elder, a chief, the head of a Bedouin family of importance with its retainers, or of a clan or tribe. When war exists, the sheiks of a region confederate together and choose one of their number as a sheik or chief. The position of Abraham with his allies, Abner and Eshcol of Mamre, much resembled that of an Arab sheik with his confederates (Gen. xiv. 13, 14). When a traveler passes through the territories of a sheik he pays for guidance and safe conduct.

SHEKEL, in Hebrew weights, the fundamental weight in the Hebrew scale. It is believed to have weighed 8.78 drachms avoirdupois, 10 pennyweights troy. Half a shekel was called a bekah, which was divided into ten gerahs. Three thousand shekels constituted a talent. In Hebrew money, a coin believed to have been worth 54.74 cents, but money was then, perhaps, 10 times as valuable as now. Shekels of the Maccabee period still exist. In shekels of three years, struck under Simon Maccabæus, the obverse has a vase, over which are the Hebrew letters aleph, shin with a beth, and shin with a gimel; the reverse, a twig with three buds and an inscription, Jerusalem Kedushah, or Hakedushah (Jerusalem the Holy). The character is the Samaritan. Other so-called shekels in the square Hebrew letters are considered forgeries.

SHELBURNE, JAMES M., an American educator, born near Taylorsville, Spencer co., Ky., in 1867. He was educated at Georgetown College, Ky., and graduated from the Southern Baptist Theological Seminary, in 1900. In the same year he was ordained to the Baptist ministry, and filled pastorates in Alabama and Virginia. In 1913 he was elected president of Howard College, serving until 1917, when he engaged in educational work for the War Work Council of the Y. M. C. A. From 1918 he was pastor of the First Church of Gadsden, Ala.

SHELBURNE, WILLIAM PETTY, EARL OF, son of the 1st earl, and maternal grandson of the famous Sir William Petty; born in Dublin, May 20, 1737. After studying at Oxford and serving in Germany, he entered the House of Commons for the borough of Wycombe in 1761, but only sat for a few weeks, the death of his father calling him to the House of Lords. When George Grenville succeeded Bute in 1763 Lord Shelburne was placed at the head of the Board of Trade, and when Chatham formed his second administration in 1766 he became one of the Secretaries of State. On the fall of Lord North's ministry in 1782, George III. sent for Shelburne and proposed to him to form a government. He declined, not being the head of a party,

and was sent by the king to the Marquis of Rockingham with an offer of the Treasury, himself to be one of the Secretaries of State. It soon appeared that Shelburne was not so much the colleague as the rival of Lord Rockingham, the chosen minister of the court, and the head of a separate party in the cabinet.

On Rockingham's death in the following July the king sent at once for Shelburne and offered him the Treasury, which he accepted without consulting his colleagues. Fox thereupon resigned, and Shelburne introduced William Pitt, then only 23, into office as his Chancellor of the Exchequer. Shelburne's ministry, on the occasion of the king's announcement of his determination to concede the independence of the American colonies, found itself outvoted by the coalition between Fox and Lord North (February, 1783). He resigned, and the coalition ministry took his place, but soon broke up. The nation expected that the king on this event would have sent for Shelburne, but William Pitt received the prize, and Shelburne was consoled by being made in 1784 Marquis of Lansdowne. The rest of his days he spent in retirement, amusing himself by collecting in Lansdowne House a splendid gallery of pictures and a fine library, and with the friendship of Priestley, Jeremy Bentham, Sir S. Romilly, Mirabeau, Dumont, and others. He died in Bowood Park, Wiltshire, May 7, 1805.

SHELBY, ISAAC, an American military officer; born in North Mountain, Md., Dec. 11, 1750; settled with his father on the site of Bristol, Tenn., in 1771, and there engaged in the herding of cattle. In 1774 he was made a lieutenant in a company commanded by his father. He was present at the action of Point Pleasant, where his skill won the day, and he commanded the fort there till July, 1775. During the battle of Long Island flats, when the American line was broken by the attack of the Indians, though present only as a private, he took command, and by his valor so inspirited the troops that they rallied and completely defeated the savages. Along with the defense of Watauga this victory saved the colonies in the South from a rear attack. Later Shelby was appointed commissary-general of the Virginia troops with the rank of captain; was made colonel in 1779; and in the following year with John Sevier planned the expedition which brought about the action of King's Mountain and changed the whole aspect of the Revolutionary War. In 1792, when Kentucky became a State he was chosen its first governor by an overwhelming majority. He refused to be a candidate for a second term, but settled down to farm life which he declined to leave for public office. When the War of 1812 broke out and Michigan fell into the hands of the enemy,

ISAAC SHELBY

though 63 years old, he recruited and led 4,000 men to re-inforce Gen. William H. Harrison. In recognition of this service Congress voted him a gold medal and he received the thanks of both that body and the Legislature of Kentucky. He died near Stanford, Ky., July 18, 1826.

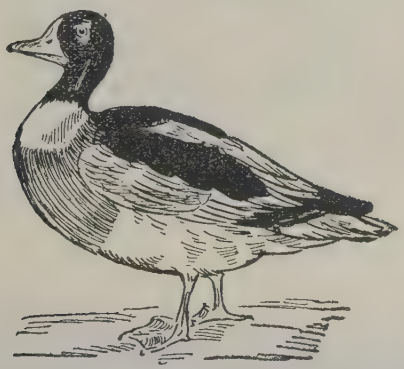
SHELBYVILLE, a city and county-seat of Shelby co., Ind.; on the Big Blue river, and on the Pittsburgh, Cincinnati, Chicago, and St. Louis, and the Cleveland, Cincinnati, Chicago, and St. Louis railroads; 26 miles S. E. of Indianapolis. It is in a rich agricultural section, and has a large general trade, flour, saw and planing mills, and manufactories of barrels, ice, glue, soda-fountains, baking powder, carriages, and furniture. Pop. (1910) 9,500; (1920) 9,701.

SHELDON, CHARLES MONROE, an American clergyman; born in Wellsville, N. Y., Feb. 26, 1857; was graduated at Brown University in 1883 and at Andover Theological Seminary in 1886; was ordained in the Congregational Church the same year, and became pastor of the Central Congregational Church, Topeka, Kan., in 1899. In 1912 he resigned to become a "minister-at-large." He was recalled to the Central Church in 1915. He edited the Topeka "Capital" for one week in 1900, as a distinctly Christian

newspaper, and was the author of numerous books including "His Brother's Keeper," "In His Steps," "Malcolm Kirk," "Edward Blake," "Born to Serve," etc. In 1920 he was appointed editor of the "Christian Herald," New York.

SHELDON, EDWARD BREWSTER, an American playwright, born in Chicago, in 1886. He graduated from Harvard University in 1907 and at once began the writing of plays. Among those were successfully produced "Salvation Nell" (1908); "The Nigger" (1909); "The High Road" (1912); "Garden of Paradise" (1915).

SHELDRAKE, in ornithology, the *Tadorna cornuta* (or *vulpanser*) of modern ornithologists; *Anas tadorna.* It is somewhat larger than an ordinary duck, with a fleshy protuberance at the base of the bill, whence its specific name. It is a very handsome bird; head and upper neck dark, glossy green, broad white collar, below which a broader band of bright



SHELDRAKE

bay extends from the back across the breast; outer scapulars, primaries, a median abdominal stripe, and a bar on tip of middle tail quills black; inner secondaries and lower tail coverts gray; speculum rich bronze green; rest of plumage white. The female is smaller and less brilliantly colored. It frequents sandy coasts in Europe and North Africa, ranging across Asia to Japan; nesting usually in a rabbit hole. The ruddy sheldrake, *T. casarca,* is a native of Barbary, southeastern Europe, and Central Asia. Its color is an almost uniform bay, the male with a black ring round the neck. The common sheldrake breeds freely in captivity.

SHELL, in zoölogy, the hard calcareous substance which either protects the testaceous mollusca externally, or supports certain species of them internally. Though shells, properly so called, which form the habitation of testaceous animals are sometimes confounded with the shelly coverings which protect the crustacea (crabs and their numerous allies), a very obvious and striking difference exists between them, as well as between the kinds of animals which respectively inhabit them. The shells of testacea are composed of carbonate of lime, combined with a small portion of gelatinous matter; they are, in general, permanent coverings for their inhabitants; and the animal is of a soft substance, without bones of any kind, and attached to its domicile by a certain adhesive property. On the other hand, those animals which are defended by a crustaceous covering cast their shells and renew them annually; while the animals themselves are of a fibrous texture, with articulated limbs, and protected, as it were, by a coat of mail.

Shells are divided into Multivalves, Bivalves, and Univalves. The first order, Multivalve, is made up of shells consisting of more shelly parts or pieces than two. The second order, Bivalve is made up of shells having two parts or valves, generally connected by cartilage or hinge; as in the cockle and mussel. The third order, Univalve, is made up of shells complete in one piece—as in the periwinkle and the whelk—and they are subdivided into shells with a regular spire, and those without a spire. The shells composing this order are far more numerous than those of the two preceding, both in genera and species. The spire is a prominent feature of the Univalve; and on its being lengthened or elevated, shortened or depressed, etc., depends much of the generic and specific definitions. Shells increase in size by the deposition of new layers internally on those already formed. Each new layer extends more or less beyond the margin of the layer to which it is applied, so that as the animal becomes older its shell becomes larger and thicker. The outer surface is generally covered by a thin layer of membranous or horny matter, named the epidermis, and the inner surface is often covered with a layer of a pearly nature.

In military usage the name shell is given to a hollow vessel of metal containing gunpowder, or other explosive compound, so arranged that it will explode at a certain point and spread destruction around by the forcible dispersion of its fragments. The invention of this missile, formerly called a BOMB (*q. v.*), cannot be accurately traced. Shells were employed in A. D. 1480 by the Sultan of Gujerat, and by the Turks at the siege of Rhodes in 1522. The Spaniards and Dutch both used them during the war

of Dutch independence; and they appear to have been generally adopted by about 1634. Formerly every shell was a hollow sphere of cast iron, having a fusehole an inch across, through which the charge was inserted, consisting of pieces of metal and powder to burst the shell. The hole was plugged by a fuse, timed to communicate fire to the charge after the lapse of a certain number of seconds. Since the introduction of rifled ordnance, the shell has become the commonest form of projectile. It has ceased to be spherical, and is usually of cylindrical form and pointed at the end. In the World War vast quantities of large explosive shells were used to blast the way for attacks. See PROJECTILE; ARTILLERY; AMMUNITION; EXPLOSIVES.

SHELLAC, lac purified by melting and straining through coarse cotton bags. It occurs in commerce in thin, translucent, hard flakes, varying in color from yellowish-brown to black, sp. gr. 1.139, and is soluble in alcohol, hydrochloric acid, acetic acid, potash, soda, borax, and ammonia. A bleached or white variety is prepared by dissolving crude lac in potash or soda, filtering and passing chlorine gas into the filtrate till all is precipitated; this is then collected, washed with water, slightly heated, and then twisted into sticks. Shellac is chiefly used in varnishes, lacquers, and in the manufacture of sealing wax.

SHELLEY, HARRY ROWE, an American composer, born at New Haven, Conn., in 1858. He studied music in New York, London, and Paris, and in 1899 became organist of the Fifth Avenue Baptist Church, New York. His works include symphonies, a symphonic poem, several cantatas, and many songs and pieces for the organ.

SHELLEY, MARY (GODWIN), an English author, second wife of the poet Shelley; born in London, Aug. 30, 1797. Her first story, "Frankenstein" (1818), won for her a place among the imaginative writers of England; it was followed by "Valperga," a historical romance (1823); "The Last Man" (1826); "Lodore" (1835); "Falkner" (1837). She died in London, Feb. 21, 1851.

SHELLEY, PERCY BYSSHE, English poet, son of Timothy Shelley and grandson of Sir Bysshe Shelley; born Horsham, England, Aug. 4, 1792; educated, Sion House (Brentford), Eton, and University College, Oxford. Of a delicate constitution he was early characterized by an extreme sensibility and a lively imagination, and by a resolute resistance to authority, custom, and every form of what he considered tyranny. At Eton he put himself in opposition to the constituted authorities by refusing to submit to fagging. At Oxford he published anonymously, a scholastic thesis entitled "The Necessity of Atheism." The authorship being known he was challenged, and refusing either to acknowledge or deny it, was at once expelled. After leaving the university, he completed his poem of "Queen Mab," begun some time previously, and privately printed in 1813. His first great poem, "Alastor, or the Spirit of Solitude," (1816), was followed in 1817 by the "Revolt of Islam," a poem

PERCY BYSSHE SHELLEY

in the Spenserian stanza. In September, 1811, six months after his expulsion, he eloped to Edinburgh with Harriet Westbrook, the daughter of a retired innkeeper. She was 16 years of age, his own age being 19. The marriage turned out unhappily, and after nearly three years of a wandering unsettled life Mrs. Shelley returned with two children to her father's house. In November, 1816, she committed suicide by drowning. Shelley was deeply affected by this event, but soon after married Mary Godwin, with whom he had visited the Continent in 1814, and by whom he already had a child. By a suit in Chancery decided in 1817, Mr. Westbrook obtained the guardianship of the children, on the plea that his atheistical opinions and irregular views on marriage made the father unfit to be intrusted with them. Partly from his lungs being affected, and partly from anxiety lest he

should be deprived of the children of his second marriage, Shelley left England in March, 1818, and the whole short remainder of his life was passed in Italy. After staying for some time with Lord Byron at Venice he proceeded to Naples; after Naples he visited Rome; and from Rome he went to Florence and Leghorn, and finally settled at Pisa. On July 8, 1822, he was sailing with a Mr. Williams in the Bay of Spezia when both were drowned by, as was believed, the upsetting of the boat through a sudden squall. His body was, according to Italian law, cremated on the seashore.

SHELTER AND HOUSING, a term which includes not only housebuilding itself, but the production of housebuilding materials, plumbing, ventilation, gas and electrical fittings, house decoration and sanitation. During and after the World War, however, it suddenly began to acquire a social significance which hitherto had not been appreciated. Labor being diverted into war industries, housebuilding practically ceased in all the civilized countries, including those not involved in the war, and rents leaped to such heights as had never been attained before, rising proportionately higher than the prices of any other necessities. The problem became still more acute after the war, when it became obvious that capital was not being invested in housing while the prices of land and building materials continued at exorbitant rates. Many plans for the promotion of housebuilding were proposed and put into practice. Among these were state subsidies, loans to building and loan associations, exemption from taxation, municipal and co-operative housing. The United States Government had been compelled to enter the field of housebuilding during the war, through the United States Housing Corporation, and completed a large part of its program for the erection of 21,000 individual houses. The first state to take direct hold of housing enterprises was Massachusetts, whose Homestead Commission received a large appropriation for the purchase and building of homes. Oklahoma also passed a law which authorized the investment of certain state funds in loans for building homes, and North Dakota, in 1919, created a State Housing Association, which acted as a building and loan association, on a state-wide basis and with the financial backing of the state. Relief from the situation was in sight at the end of 1920, when the investigations of the Lockwood Committee of New York demonstrated the fact that the manufacturers and dealers in housing materials had formed a national combine to hold up their prices, which were then 150 per cent higher than they had been before the war. Almost immediately after the beginning of the investigation prices began falling, and, though they soon rose again, by the end of the year there was a considerable renewal of activity in the housing industry.

SHEM, one of the three sons, and according to many commentators the elder son, of Noah (Gen. v. 32), from whom descended the nations enumerated in Gen. x. 22, *sq.*, and who was the progenitor of that great branch of the Noachian family called from him Shemitic or Semitic, to which the Hebrews belong. See SEMITES.

SHEMAKHA, a town in Transcaucasia, Russia; on the Zagolavan river; 70 miles from Baku; 2,230 feet above the level of the Black Sea. It has numerous ruins of large caravansaries, churches, and public buildings; and is the capital of Shirvan. In February, 1902, it was visited by a great earthquake, in which 4,000 houses were destroyed and 2,000 people perished. Pop. about 23,000.

SHENANDOAH, a river of the United States, which flows N. E. through the valley of Virginia, and immediately below Harper's Ferry joins the Potomac, of which it is the principal tributary. Its length is 170 miles, the greater part of which is navigable for boats. The valley of the Shenandoah was the scene of numerous military operations in the American Civil War, and was devastated by General Sheridan in 1864.

SHENANDOAH, a borough in Schuylkill co., Pa.; on the Philadelphia and Reading, the Lehigh Valley, and the Pennsylvania railroads; 13 miles N. of Pottsville. Here are a number of the largest coal mines in the rich anthracite coal section of which it is the center. It also contains a high school, street railroad and electric light plants, public library, building and loan association, National and other banks, a daily and several weekly newspapers. It has hat factories, and other industries. Pop. (1910) 25,774; (1920) 24,726.

SHENANDOAH, a city of Iowa, in Page co. It is on the Chicago, Burlington, and Quincy, the Keokuk and Western, and the Wabash railroads. It is the center of an important fruit-growing and poultry-raising region. Its industries include the manufacture of wagons, plows, knit goods, etc. Its notable buildings include an Elks' Home, a Carnegie Library, the Western Normal College, and the World's Missionary Training School. Pop. (1910) 4,976; (1920) 5,255.

SHENANDOAH, THE, a ship in the Confederate service during the American Civil War. It was built at Glasgow in 1863 for the China trade, and in 1864 was purchased by the Confederates. Her war record included the capture of 38 Federal vessels. Lieut. J. I. Waddell was in command from 1864 to 1865, while the Shenandoah was a privateer. On Oct. 19, 1864, the vessel was commissioned and ordered on a Pacific cruise. Before reaching Melbourne she made nine captures. From Australia she sailed N., and in the whaling regions did much destruction among the New England whaling fleets. This career was continued for several months after Lee's surrender, and included the last hostile acts of the Civil War. When Commander Waddell learned of the close of the war, he sailed to Liverpool and surrendered to the British Government. The commander and crew were liberated and the ship was handed over to the United States consul. The Shenandoah was the only vessel that carried the Confederate flag around the world.

SHENANDOAH MOUNTAINS, a range of the Alleghenies forming the W. boundary of the Shenandoah valley in Virginia.

SHENANDOAH VALLEY, a valley in Virginia; between the Blue Ridge on the E. and the Shenandoah Mountains on the W. It is noted for its beautiful scenery, hilly and broken, with intervening fertile slopes and extents of high rolling land. It has large forests of various kinds of trees, including oak, chestnut, and hickory. The entire valley is of great historic interest, having been the arena of thrilling events in the American Civil War, including "Stonewall" Jackson's campaign in 1862, and that conducted by Sheridan in 1864.

SHENANGO, a river in the N. W. part of Pennsylvania, joining the Mahoning near New Castle, the two rivers forming the Beaver. It is about 90 miles long.

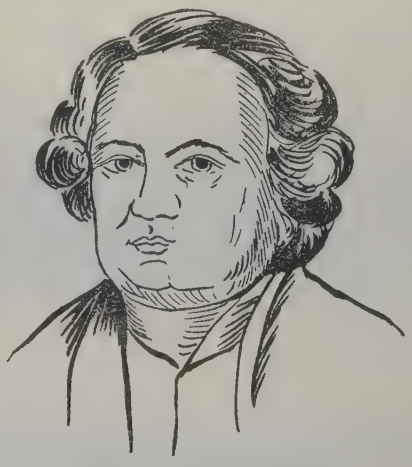
SHENG-KING, or LIAO TUNG. See SHINGKING and LIAO TUNG.

SHENG-LI, wild aborigines of Hainan (*q. v.*). They are intractable, given to feuds and, though armed only with spear and bow, have been a source of much trouble to the Chinese authorities.

SHENOUTE (SINUTHIUS), abbot of Atrepe (Suhag), near Akhmin, Egypt. He was the Coptic leader who, in the 4th century, organized a national church and led the forces which successfully warred on idolatry (see COPT, COPTIC). Died A. D. 451.

SHEN-SI, a province of China; bounded on the N. by Mongolia, on the E. by the Hwang-ho and Honan, on the S. by Hupeh and Sze-chuen, and on the W. by Kansuh; area, 75,270 square miles. The Tsing-ling mountains divide the province into two distinct regions, of which the northern is the more important. Shen-Si is chiefly an agricultural province, but contains very extensive coal fields, both anthracite and bituminous, and abundant deposits of iron ore. A British syndicate obtained a concession for working the Shen-si mines. In 1901 the famine in Shen-si was so severe that cannibalism was resorted to and it was estimated that 30 per cent of the population died. From Si-ngan-foo, the provincial capital, and anciently the capital of the empire, radiate a number of roads going E., S., and W., and Shen-si is thus the great channel of communication between China and Central Asia. Pop. 6,725,000.

SHENSTONE, WILLIAM, an English poet; born at the Leasowes, near Halesowen, England, in November, 1714. His best-remembered poems are: "The School-



WILLIAM SHENSTONE

mistress" (1742); "The Pastoral Ballad" (1755); and "Written in an Inn at Henley." His "Works" and "Letters" were collected in three volumes (1764-1769); and his "Essays on Men and Manners" were republished in 1868. He died near Halesowen, Feb. 11, 1763.

SHEOL, in Jewish belief, the place of the dead, from a Hebrew work meaning a cave. In the Authorized Version of the Bible it is translated by the words, hell, grave, or pit. In the Revised Version the word "sheol" is generally left untranslated in the text, while "grave" is put in the margin. For instance, in Ps.

ix. 17, "The wicked shall be turned into hell" (Authorized Version), becomes, "The wicked shall return to sheol" (Revised Version). See HELL.

SHEPARD, FINLEY JOHNSON, an American railway official, born at Saybrook, Conn., in 1867. He was educated at Seabury Institute, in Saybrook, and engaged in the railroad business, becoming, in 1901, general superintendent of the Sante Fé Coast Lines, serving until 1905. He was a director of many railroads and in many important financial institutions. In 1913 he married Helen Miller Gould, daughter of Jay Gould.

SHEPHERD KINGS, the chiefs of a nomadic tribe of Arabs, who established themselves in Lower Egypt some 2,000 years B. C. Manetho says they reigned 511 years, Eratosthenes says 470 years, Africanus, 284 years, Eusebius, 103 years. Some say they extended over five dynasties, some over three, some limits their sway to one; some give the name of only one monarch, some of four, and others of six. Bunsen places them 1639 B. C.; Lepsius, 1842 B. C.; others, 1900 or 2000 B. C.

SHEPHERD, WILLIAM GUNN, an American writer and war correspondent, born in Springfield, Ohio, in 1878. He was educated in the high schools of St. Paul, and at the University of Michigan. He began newspaper work in 1898, in St. Paul. In 1908 he removed to New York, and acted as correspondent for newspapers in Mexico during the Madero revolution. In 1912 he was in Europe as a correspondent. At the outbreak of the World War he represented newspapers in the United States and saw service in every capital and with every army of both sides of the conflict, except the Turks, Bulgars, and Rumanians. He wrote many articles on the war and the campaigns. He attended the Peace Conference, and wrote an account of its deliberations for several papers. He wrote "The Confessions of a War Correspondent" (1917); "The Scar That Tripled" (1918).

SHEPHERD, WILLIAM R., an American educator, born at Charleston, S. C., in 1871. He graduated from Columbia in 1893, and took post-graduate studies in Berlin and Madrid. He was professor of history at Columbia University, and honorary professor of the University of Chile. He acted as delegate to the 1st Pan-American Scientific Congress, in 1908-9, and was secretary of the United States delegation at the 4th International Conference of American States, in 1910. He was a correspondent and a member of many Spanish-American societies. He wrote "Latin America"; "Central and South America"; "The Hispanic Nations of the New World"; "The Story of New Amsterdam," and many articles on the history of colonization.

SHEPHERD'S DOG, a popular name for many varieties of *Canis familaris*, used to tend and drive sheep. The English shepherd's dog has a longish head, with a sharp muzzle, and good breadth over the forehead; his ears are slightly raised, and his coat is short and wooly; tail usually long and bushy; he is less faithful and sagacious than the collie. The drover's dog is larger and stronger, and has usually a strain of mastiff blood.

SHEPHERD'S PURSE (*Capsella bursa pastōris*), a plant of the natural order *Cruciferæ*. It is an annual weed, found in all temperate climates, having simple or cut leaves and small white flowers.

SHEPPARD, MORRIS, a United States Senator from Texas, born in Wheatville, Texas, in 1875. He graduated from the University of Texas in 1895, and after studying law at Yale, was admitted to the bar and engaged in practice in Texas. In 1902 he was elected to the 57th Congress and was re-elected to the 58th and 62nd Congresses. He was elected to the United States Senate in 1913 for the unexpired term of Joseph W. Bailey. On the same day he was elected for the term of 1913 to 1919, and was re-elected in 1918.

SHEPPEY, an island of England, in the county of Kent, at the mouth of the Thames, between the estuaries of the Medway and the Swale. It is 9 miles long and 5 broad, is rich and fertile, and contains the town of Sheerness.

SHERBROOKE, ROBERT LOWE, VISCOUNT, an English statesman; born in Bingham, England, Dec. 4, 1811; was educated at Winchester and Oxford. Called to the bar in 1836, he went to Australia in 1842, practiced in Sydney; took a leading part in politics and became a member for Sydney. At home again in 1850, and returned in 1852 as a member of Parliament, he in 1853 took office under Lord Aberdeen, and in 1855 under Lord Palmerston. During 1859-1864 he was vice-president of the Education Board, and introduced the Revised Code of 1862, with its principle of "payment by results." He opposed the Whig Reform Bill in 1866. In 1868 he aided the Liberal leaders in carrying the disestablishment of the Irish Church. He obtained in Mr. Gladstone's ministry the office of Chancellor of the Exchequer; exchanging it in 1873 for that of Home Secretary. In

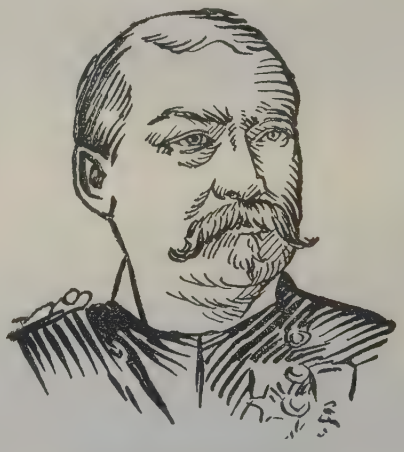
education he opposed the once exclusive study of the classics. In 1880 he went to the Upper House as Viscount Sherbrooke. He wrote "Poems of a Life" (1884). He died in Warlingham, England, July 27, 1892.

SHERE ALI KHAN, Ameer of Afghanistan; born in 1825; succeeded his father, Dost Mohammed, in 1863. During the earlier part of his reign he passed through many vicissitudes, but by 1868 he was fully established on the throne of Kabul. In 1869 he entered into friendly relations with the Indian Government. In 1878 a Russian mission was received with honor at Kabul, and shortly afterward permission was refused for a British mission to cross the frontier. Thereupon the British invaded Afghanistan and took possession of the Khyber Pass and the Kuram Valley. Shere Ali fled from Kabul, accompanied by the members of the Russian mission. He died in Afghan Turkestan, Feb. 21, 1879. He was succeeded by his second son, Yakub, who, however, on account of the Cavagnari massacre, was speedily deposed and deported to India, and was succeeded by his cousin, Abdurrahman, in 1880, who died Oct. 3, 1901. See AFGHANISTAN.

SHERIDAN, MOUNT, a mountain of Wyoming, situated in the Yellowstone National Park; is a summit of the Red Range of the Rocky mountains. It is 10,420 feet high, with a range of vision over an immense expanse and several hundred distinct mountain summits, at distances varying from 30 to 200 miles. A large part of it is formed of porphyry of a purplish-pink color; and was named for Gen. Philip H. Sheridan.

SHERIDAN, a city of Wyoming, the county-seat of Sheridan co. It is on the Chicago, Burlington, and Quincy railroad. It is the center of an important stock-raising and coal mining region. It has a State Hospital and a public library. Pop. (1910) 8,408; (1920) 9,175.

SHERIDAN, PHILIP HENRY, an American military officer; born in Albany, N. Y., March 6, 1831; was graduated at the Military Academy at West Point in 1853. Entering the United States artillery, he served in Texas and Oregon till 1855, when he sailed for San Francisco in command of an escort to the expedition for surveying the proposed branch of the Pacific railway between San Francisco and the Columbia river. Afterward he commanded a body of troops among the Indian tribes till 1861, when he was promoted captain. On the breaking out of the Civil War he was appointed quartermaster of the army in Southwestern Missouri; in 1862 became chief quartermaster of the Western Department, and colonel of the 2d Michigan Volunteer Cavalry. He cut the railroads S. of Corinth; defeated two separate forces of cavalry at Baldwin and Guntown in June, 1862, and fought at Booneville; was promoted brigadier-general of volunteers; took command of the 11th Division of the Army of Ohio; distinguished himself at Perryville and at Stone river or Murfreesboro, Dec. 31 and Jan. 3, 1863, for which he was promoted major-general of volunteers. He was engaged at Chickamauga, Sept. 19 and 20, 1863, and in the operations around Chattanooga; was appointed, in April, 1864, to the command of the cavalry corps of the Army of the Potomac; took part in



PHILIP HENRY SHERIDAN

the battles of the Wilderness, Meadow Bridge, and Cold Harbor, in May; in June, led a cavalry expedition into the heart of the Confederate country and was given the command of the Army of the Shenandoah; defeated General Early in several engagements in the Shenandoah valley. On Oct. 19 occurred his famous ride from Winchester. Under orders from Grant he devastated the valley. He was appointed to the chief command of the cavalry, which branch of the Federal forces, under his able and energetic direction, acquired an efficiency and gained a reputation such as it had never borne before. Sheridan was promoted brigadier-general, U. S. A., Sept. 20, 1864, and major-general, Nov. 8 of the same year. On Feb. 9, 1865, the thanks of Congress were tendered to him for "the gallantry, military skill, and courage displayed in the brilliant series of victories achieved by his army in the valley of the Shenandoah, especially at Cedar Creek." After the capture of Staunton, he pressed on

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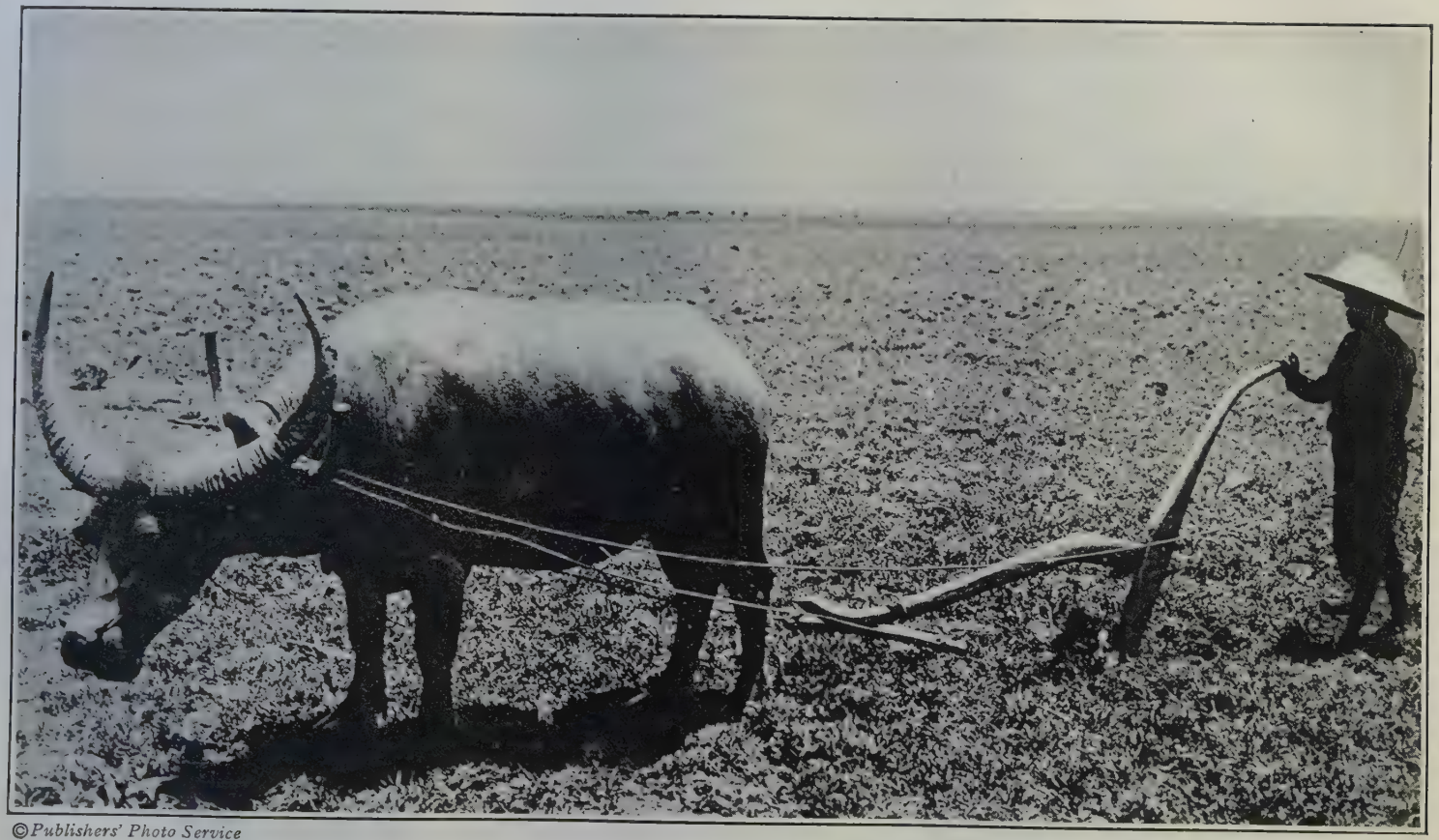
TRAVELING ON THE BACKS OF ELEPHANTS IN SIAM



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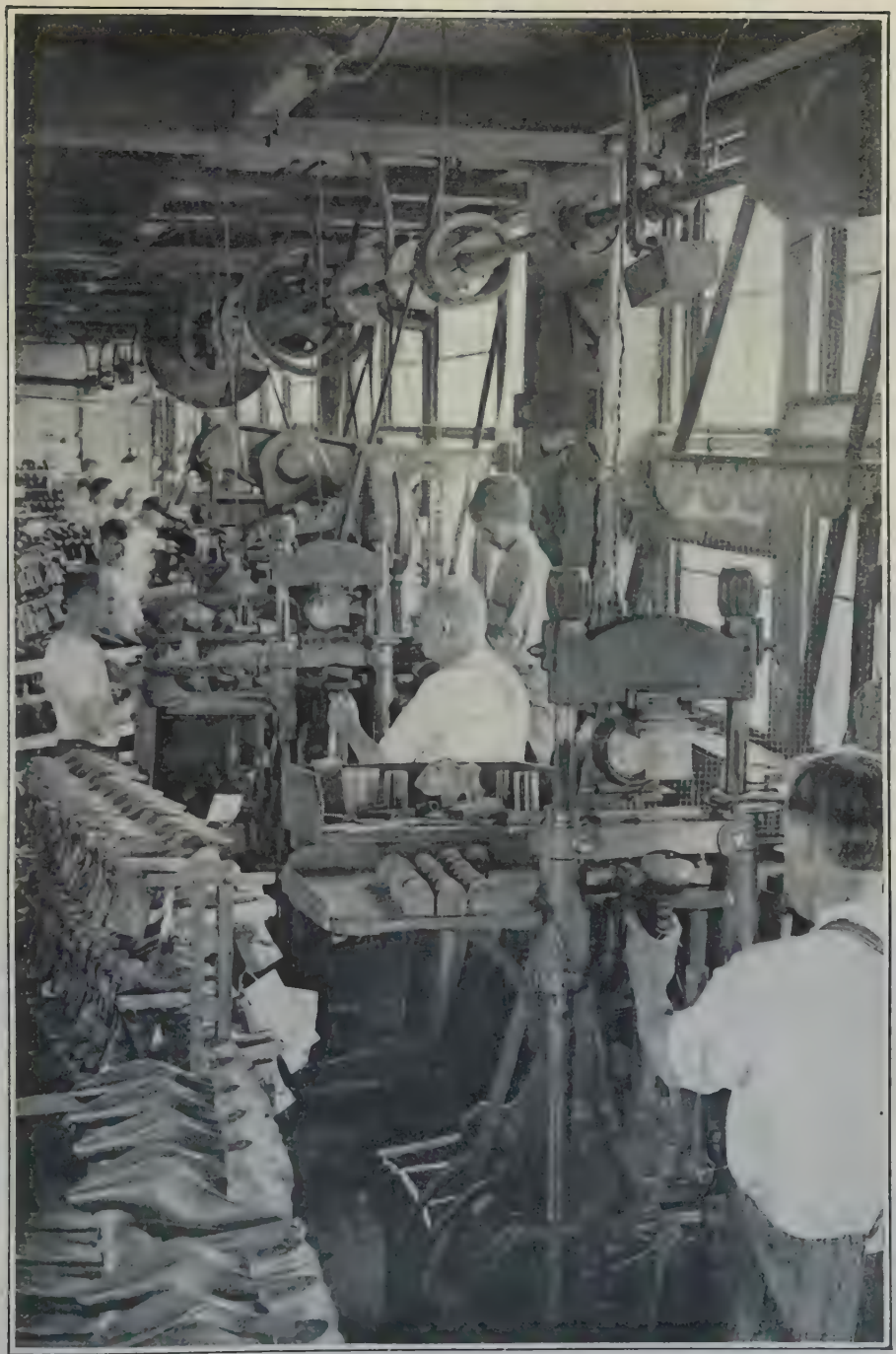
PLOWING WITH A PRIMITIVE PLOW, DRAWN BY A WATER BUFFALO, SIAM



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INTERIOR OF AN AMERICAN SHOE FACTORY

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MOTH, COCOONS, AND EGGS OF SILKWORM

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A JAPANESE WOMAN PLACING SILKWORMS ON MULBERRY LEAVES

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COCOONS OF THE SILKWORMS IN THE NESTS PROVIDED FOR THEM

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DELICATE MACHINERY FOR REELING THE SILK FROM COCOONS

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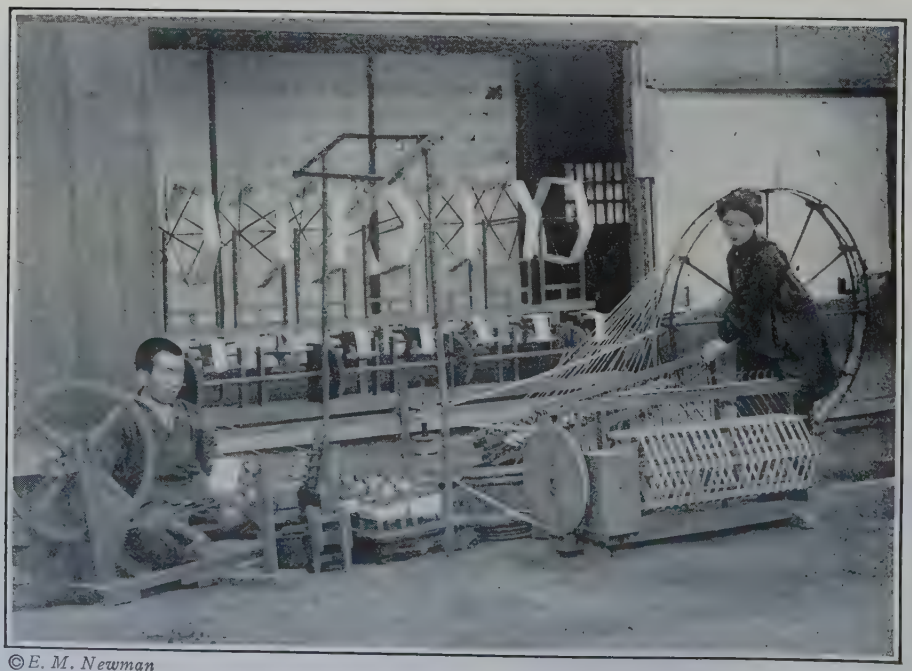
REMOVING THE COCOONS



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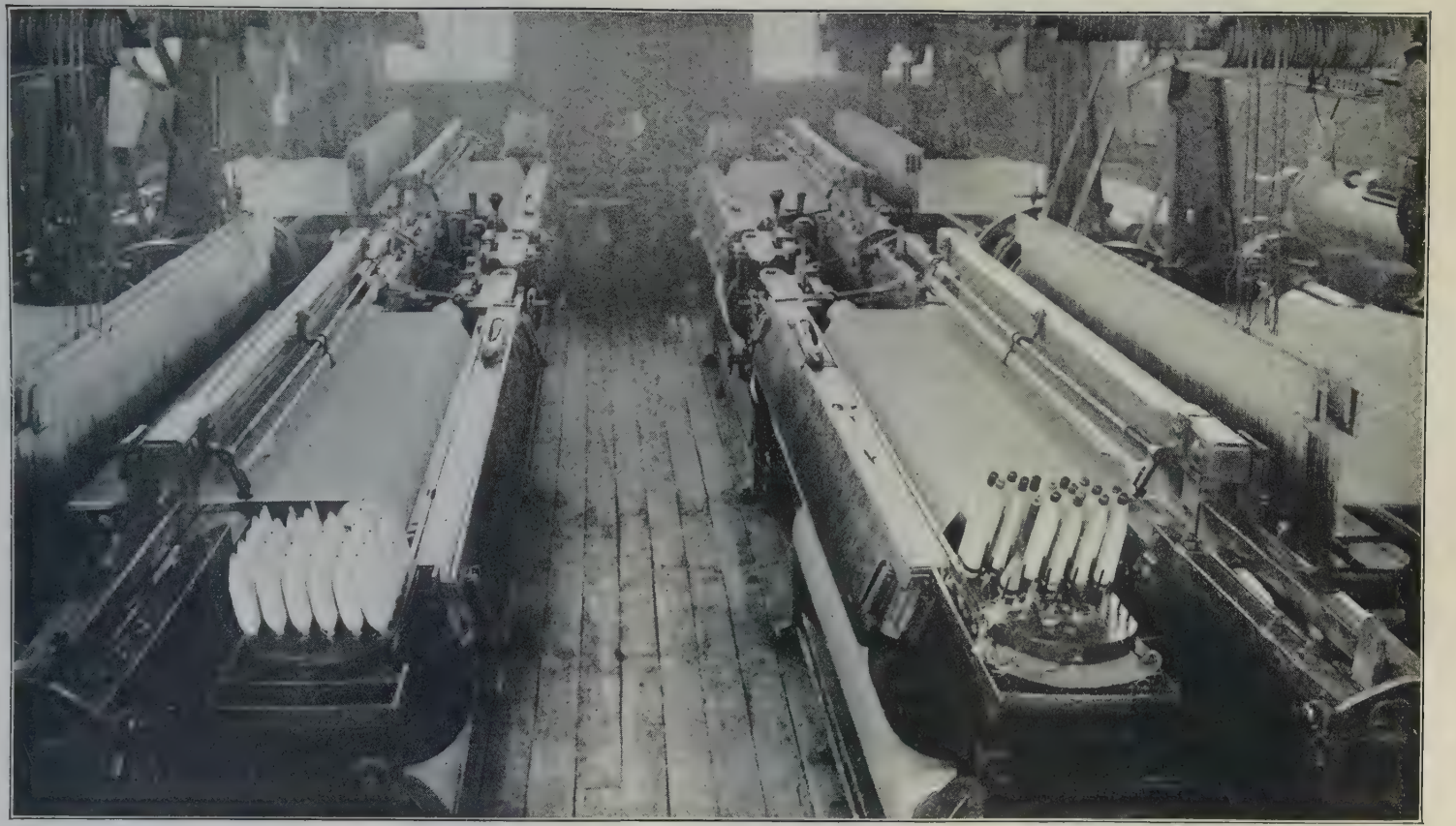
SPINNING THE SILK



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HIGH SPEED, BROAD GOODS, FRENCH LOOMS, USED IN AN AMERICAN SILK MILL

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TOWN AND HARBOR OF SITKA, ALASKA

to Columbia, laying waste the country in every direction; gained the battle of Five Forks, April 1, 1865; assisted in compelling the Confederate forces to evacuate Petersburg and Richmond, and near Appomattox Court House encountered General Lee, who surrendered April 9. General Sheridan was in command of the Military Division of the Southwest from June 3 to July 17, 1865; of the Military Division of the Gulf, July 17, 1865, to Aug. 15, 1866; of the Department of the Gulf, Aug. 15, 1866, to March 11, 1867; of the District of Louisiana and Texas, March 11 to Sept. 5, 1867; and of the Department of the Missouri, Sept. 12, 1867. On March 4, 1869, he was promoted lieutenant-general, and Nov. 1, 1883, succeeded Sherman in command of the army. Congress revived the grade of general, to which he was appointed, June 1, 1888. He died in Nonquitt, Mass., Aug. 5, 1888.

SHERIDAN, RICHARD BRINSLEY BUTLER, an English dramatist; born in Dublin, Ireland, Sept. 30, 1751; son of Thomas Sheridan (1719-1788); educated in Dublin and at Harrow. In 1772 he eloped to France with Miss Linley, a young singer of great beauty and accomplishments. In 1775 he brought out "The Rivals," which attained a brilliant success. On Nov. 21 he produced the comic opera "The Duenna," which had a run of 75 nights, an unprecedented success. In 1776 he became one of the proprietors of Drury Lane Theater, where in 1777 appeared "The School for Scandal," his most famous comedy, and in 1779 "The Critic," a farce. In 1780 he became a member of Parliament. In 1782 he became under-secretary of state; in 1783, secretary of the treasury; in 1806, treasurer of the navy and privy-councillor. His greatest effort as an orator was his "Begum" speech on the impeachment of Warren Hastings (1787). His wife died in 1792. In 1795 he married Miss Ogle, a daughter of the Dean of Winchester. His Parliamentary career ended in 1812. In addition to the plays mentioned, he wrote: "A Trip to Scarborough" (1777); "The Stranger," and "Pizarro" (1799). His speeches were published in five volumes (1816). He died in London, July 7, 1816, and was buried in Westminster Abbey.

SHERIDAN, THOMAS, an English scholar; grandfather of Richard B. Sheridan; born in 1687. He was a close friend and confidant of Swift's, and was noted for his learning and eccentricities. He wrote the "Art of Punning," and published an edition of Persius. He died in 1738. His son, THOMAS, father of the dramatist; born in 1719; was educated at Westminster School and Trinity College, Dublin. He became an actor and teacher of elocution, and published a "Plan of Education," "Life of Swift," and a "Dictionary of the English Language." He died in 1788. His wife, FRANCES CHAMBERLAINE (1724-1766), was the author of two novels, "Sidney Bidulph" and "Nourjahad"; and two plays, "The Discovery" and "The Dupe."

SHERIF, an Arabic title equivalent to noble, borne by the descendants of Mohammed. It descends both in the male and female line. Those who possess this rank are distinguished by green turbans and veils, green being the color of the Prophet. The title is applied specifically to the chief magistrate of Mecca.

SHERIFF, the chief officer of a shire or a county, to whom is intrusted the execution of the laws, the serving of judicial writs and processes, and the preservation of the peace. In the United States the sheriff is either elected by the Legislature or the citizens, or appointed and commissioned by the executive of the State. The office is almost exclusively ministerial. The sheriff in person or by deputy executes civil and criminal process throughout the county, has charge of the jail and prisoners, attends courts, and keeps the peace. His judicial authority is generally confined to ascertaining damages on writs of inquiry, etc.

In England the sheriff is the chief officer of the crown in every county or shire, to whom the charge of the county is committed by letters patent. He is appointed (except in the case of London and the county of Middlesex) by the crown out of three names submitted for each county by the judge who goes on circuit.

In Scotland the sheriff is a law officer whose functions seem to have been originally, like those of the sheriffs in England, mainly executive, but who now is judge in a county court. The office is by the appointment of the crown. Nearly all the sheriffs are now practicing lawyers resident in Edinburgh, sheriff-substitutes acting for them as local judges in the several counties. The sheriff-substitute can try criminal cases when a conviction will not involve more than two years' imprisonment. The lord-lieutenant of a Scotch county sometimes receives the honorary title of sheriff-principal.

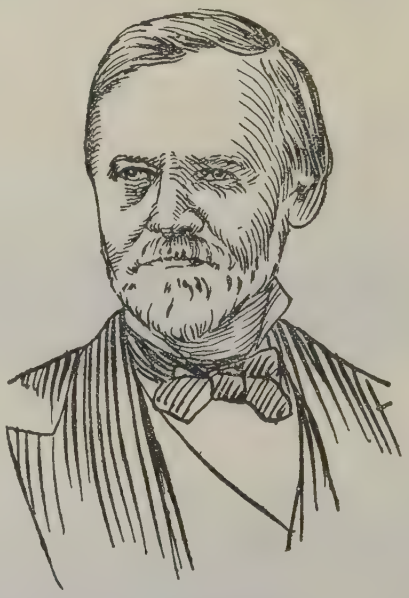
SHERIFFMUIR, or SHERIFF MOOR, a place in Scotland, in the parish of Dunblane, in Perthshire. Here an indecisive battle was fought between the troops of George I. under the Duke of Argyle, and a rebel force of the adherents of the Stuarts under the Earl of Mar, in 1715.

SHERMAN, a city and county-seat of Grayson co., Tex.; on the Texas and Pacific, the Houston and Texas Central, the Missouri, Kansas, and Texas, and the St. Louis Southwestern railroads; 64 miles N. of Dallas. It contains Austin College (Pres.), North Texas Female College (M. E.), Carr-Carlton Christian College for Women, public library, Y. M. C. A. Building, Federal buildings, waterworks, electric lights, National and other banks, and daily and weekly newspapers. It has cotton gins, a cotton-seed oil mill, machine shops, foundries, flour mills, planing mills, carriage and wagon factories, marble and brick works, etc. Pop. (1910) 12,412; (1920) 15,031.

SHERMAN, FRANK DEMPSTER, an American poet; born in Peekskill, N. Y., May 6, 1860. Educated at Columbia College and Harvard University, he became adjunct professor in the Columbia School of Architecture. He published: "Madrigals and Catches"; "Lyrics for a Lute"; and, with John Kendrick Bangs, "New Waggings of Old Tales"; "Little Folk Lyrics"; "Lyrics of Joy" (1904); "A Southern Flight" (with Clinton Scollard, 1906); and "Complete Poems" (1918). He died in 1916.

SHERMAN, JAMES SCHOOLCRAFT, an American public official, and vice-president of the United States, born at Utica, N. Y., in 1855. He graduated from Hamilton College in 1878, and after studying law, was admitted to the bar in 1880. For several years he practiced his profession in Utica. He was early interested in politics and was elected chairman of the Oneida Republican County Committee while he was still a young man. In 1884-1885, he was mayor of Utica, and from 1887 to 1891, and again from 1893 to 1909, he was a member of Congress. He served as chairman of the Republican State conventions in 1895, 1900, and 1908, and chairman of the Republican National Congressional Committee in 1906. He was nominated vice-president on the ticket of William H. Taft, and was elected in 1908. He died in 1912.

SHERMAN, JOHN, an American statesman; born in Lancaster, O., May 10, 1823; brother of Gen. William T. Sherman; was admitted to the bar in 1844; served as a delegate to the National Whig conventions of 1848 and 1852; and was a member of Congress in 1855-1861. He took a prominent part in the proceedings of the House; was on the Committee of Inquiry sent to Kansas; and joined the movement for the formation of the Republican party. In 1861-1877 he was in the Senate and there was prominently identified with the support of all measures for the prosecution of the Civil War; defended the protective tariff, the restoration of specie payments, and the refunding of the National debt. He was a member of the committee that visited Louisiana to supervise the counting of the returns of that State, and a member of

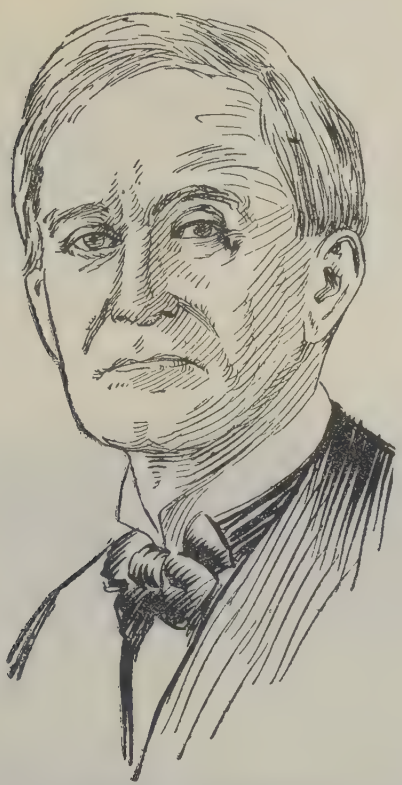


JOHN SHERMAN

the Electoral Commission. He was Secretary of the Treasury in 1877-1881, and superintended the resumption of specie payments in 1879, after a suspension of 17 years. He was re-elected to the Senate in 1881 and continued to hold that office till 1897, when he was appointed Secretary of State by President McKinley. He resigned that office, however, in 1898, on account of failing health. In 1885 he was president of the Senate *pro tem.*, but declined re-election at the end of the 49th Congress. He was a candidate for the presidential nomination in 1884 and 1888. Among his publications are: "Selected Speeches and Reports on Finance and Taxation" (1879); and "Recollections of Forty Years in the House, Senate, and Cabinet" (1893). He died in Washington, D. C., Oct. 22, 1900. See SHERMAN ACT.

SHERMAN, LAWRENCE YATES, a United States Senator from Illinois, born in Miami co., Ohio, in 1858. In the following year his parents removed to Illinois. He was educated in the common schools and studied law at McKendree College. He practiced law in Chicago and from 1886 to 1890 was county judge of McDonough County. From 1897 to 1899

he was a member of the Illinois House of Representatives, and was re-elected in 1900. He was lieutenant-governor of the



LAWRENCE YATES SHERMAN

State from 1904 to 1908, and in 1909 was elected United States Senator to fill the unexpired term of William Lorimer. He was re-elected in 1914 but declined to stand for re-election in 1920.

SHERMAN, ROGER, an American statesman; born in Newton, Mass., April 19, 1721; was early apprenticed to a shoemaker, and continued in that trade till 1743, when he removed to New Milford, Conn., and engaged in mercantile business with his brother. In 1745 he was appointed surveyor for his county, and not long afterward furnished the astronomical observations for an almanac published in New York. He was admitted to the bar in 1754; was several times elected to the Colonial Assembly; and in 1759 became judge of the Court of Common Pleas. Having removed to New Haven, Conn., in 1761, he became judge of the Common Pleas there in 1765, and a member of the upper house of the Legislature. He was a member of the Continental and National Congress in 1774-1791; one of the committee to draft the Declaration of Independence, of which he was a signer; and in 1787, in conjunction with Dr. Samuel Johnson and Oliver Ellsworth, served as a delegate to the convention charged with the duty of framing the Federal Constitution. He died in New Haven, Conn., July 23, 1793.

SHERMAN, THOMAS WEST, an American military officer; born in Newport, R. I., March 26, 1813; was graduated at the United States Military Academy in 1836 and assigned to duty with the 3d Artillery. He served in the Florida and Mexican Wars, and for his services in the latter was brevetted major, Feb. 23, 1847. At the outbreak of the Civil War he was placed in command of a battery of United States artillery and later was made chief of light artillery in the defense of Washington, D. C. He organized an expedition for the capture of Bull's Bay, S. C., and Fernandina, Fla., for the use of the blockading fleet on the southern coast; commanded the land forces of the Port Royal expedition in 1861-1862; led a division in the Department of the Gulf in 1862-1863, and participated in the siege of Corinth. While leading a column in the assault on Port Hudson, La., on May 27, 1863, he lost his right leg, in consequence of which he was on leave of absence till February, 1864. On his return to duty he was placed in command of a reserve brigade of artillery in the Department of the Gulf, and later took charge of the defenses of New Orleans and the Southern and Eastern Districts of Louisiana. On March 13, 1865, he was brevetted major-general of volunteers and major-general, U. S. A., for gallant services during the war. After the war he commanded at Fort Adams, R. I., and at Key West, Fla. He was retired as full major-general, U. S. A., on Dec. 31, 1870; and died in Newport, R. I., March 16, 1879.

SHERMAN, WILLIAM TECUMSEH, an American military officer; born in Lancaster, Ohio, Feb. 8, 1820. His father, one of the judges of the Supreme Court of Ohio, died in 1829, and William was educated in the family of Thomas Ewing till he had reached the age of 16, when he went to the United States Military Academy; was graduated there in 1840, entered the army, and was promoted to 1st lieutenant in 1841. He acted as assistant adjutant-general in 1847, and obtained a brevet of captain, May, 1848, for meritorious services in California during the war with Mexico. He was appointed commissary of subsistence in 1850, served at St. Louis and New Orleans, but finding his pay inadequate to support his

family, resigned his commission Sept. 6, 1853, and removed to San Francisco, where he engaged in the banking business till 1858, when he went to Leavenworth, Kan., leaving there in July, 1859, on being elected superintendent of the Louisiana State Military Institute, which position he resigned when the Civil War began. After the fall of Fort Sumter he was commissioned colonel of the 13th United States Infantry, and commanded the 3d Brigade at the battle of Bull Run, July 21, 1861. On the reorganization of the

WILLIAM TECUMSEH SHERMAN

National army he was made brigadier-general of volunteers, accompanied General Anderson to Kentucky, succeeded him temporarily in command till at his own request he was relieved by General Buell and was ordered to Missouri. In the early part of 1862 he was appointed to the command of a division under General Grant, and acted with great bravery at the battle of Shiloh, April 6; was promoted to major-general, May 1; and when the Department of Tennessee was formed, in December, was made commander of the 15th Army Corps. At the end of that month he led an expedition to Vicksburg; but the works were too strong to be taken by assault, and he was obliged to withdraw his troops after a severe fight. He commanded the wing of the army that captured Fort Hindman, Ark., Jan. 10, 1863, after which he resumed command of the 15th Army Corps; took part in the siege of Vicksburg, which capitulated July 3, 1863; and led the expedition which captured Jackson City, July 10.

When General Grant was placed in command of the army previously under General Rosecrans, he gave the command of the Department of the Tennessee to General Sherman, who encountered General Longstreet, and obliged him to retreat, Nov. 20; and in February, 1864, made his expedition to Meridian, Miss., and broke up that important railroad center, driving General Polk's army out of Mississippi. Having been charged with the command of the army in Georgia, May 4, he commenced the expedition through that State which ended in the capture of Atlanta, the capital city. General Hood thrice attacked the Federal army and was repulsed, sustaining considerable loss. After his third failure General Hood acted merely on the defensive in Atlanta, which fell into the hands of the Nationals in the beginning of September. In October Hood began his movement toward Tennessee. Sherman followed him as far as Resaca, 75 miles, drove him from the railroad, and then sent part of his army to Tennessee to defend that State, and with the balance began his "march to the sea," to act in concert with the Union army in Virginia against Lee. The distance from Atlanta to Savannah is 290 miles. General Sherman accomplished the march with very little loss in 23 days; and Savannah fell into his hands Dec. 21, 1864. The news of its capture was received with great rejoicing in the North, not only because it showed how triumphant the campaign in Georgia had been, but because it opened up the seaboard of that State and inflicted a heavy blow on the Confederate cause. General Sherman defeated the Confederates at Bentonville, N. C., March 19, 1865, and soon afterward paid a visit to General Grant, to concert those measures for the defeat of General Lee which ended in the submission of that general and that of Gen. J. E. Johnston, who surrendered his army to General Sherman, April 26, 1865, which was one of the closing actions of the war. General Sherman was promoted to the rank of lieutenant-general, July 25, 1866; succeeded General Grant as general, March 4, 1869; was retired Feb. 8, 1884, and died in New York City, Feb. 14, 1891.

SHERMAN ACT, an act of the United States Congress, approved July 14, 1890. It was the culmination of a long disagreement between the two Houses over a financial policy, neither side being disposed to yield. This bill was supported

by Senator Sherman and others as a compromise measure. It instructed the Secretary of the Treasury to buy silver bullion to the amount of 4,500,000 ounces a month, and to issue Treasury notes in payment. Though the bill was approved, the financial policy continued to be a disturbing question and arguments favoring a repeal were presented at almost every opportunity. The business depression of the summer of 1893 was believed to be a consequence of the bill, and President Cleveland summoned Congress to convene in special session, Aug. 7. A bill to repeal the silver-purchasing proviso of the Sherman Act passed the House Aug. 28. In the Senate, the Voorhees bill was presented as a substitute, its provisions being a repeal of the silver-purchasing clause, but affirming bimetallism as a National policy. After a protracted contest the Voorhees bill passed the Senate, Oct. 30. It was concurred in by the House Nov. 1, and the President approved it the same day.

SHERRILL, CHARLES HITCHCOCK, an American lawyer, born in Washington, D. C., in 1867. He was educated at Yale University and practiced law in New York, from 1891 to 1909. From 1909 to 1911 he was United States Minister to Argentina. He resumed practice of law in 1912. Besides taking an active part in politics, he was president of the Yale Law School Alumni; chairman of the Committee on Foreign Relations of the National Chamber of Commerce; trustee of St. Luke's Hospital, Tokio, Japan; of the American College for Girls, Constantinople, Turkey; of New York University, as well as of a number of numerous societies and clubs. He originated a series of international inter-university track meets in 1894. During the World War he served as adjutant-general, with the rank of brigadier-general, in charge of the United States draft. He published "Stained Glass Tours in France" (1908); "Stained Glass Tours in England" (1909); "Stained Glass Tours in Italy" (1913); "French Memories of Eighteenth Century America" (1915); "Modernizing the Monroe Doctrine" (1916); "Have We a Far-Eastern Policy?" (1920).

SHERRY, a favorite Spanish wine, prepared from small white grapes grown in the province of Andalusia, those which furnish the better qualities being cultivated in the vineyards of Xeres. In the manufacture of sherry the grapes are not gathered till they are quite ripe, and the fermentation is continued till nearly all the sugar has been converted into alcohol. Sherries may be divided into natural, containing from 20 to 26 per cent. of proof spirit, and fortified, containing from 30 to 40 per cent. Sherry is used in many of the wines of the pharmacopœia, as *Vinum ferri*, etc.

SHERWOOD FOREST, an ancient royal forest in Nottinghamshire, England, celebrated for the exploits of Robin Hood and his followers.

SHERWOOD, GRANVILLE HUDSON, an American bishop of the Protestant Episcopal Church, born in Elgin, Ill., in 1878. He was educated at St. Paul's School, Concord, N. H.; Trinity College, Hartford, Conn.; University of Chicago; and the Western Theological Seminary, from which latter institution he received the degree of D.D., in 1917. In 1903 he was made a deacon and priest of the Protestant Episcopal Church. From 1903 to 1905 he served as rector of Christ Church, Streator, Ill.; from 1905 to 1917 as rector of Trinity Church, Rock Island, Ill.; and in April, 1917, became bishop of Springfield, Ill.

SHERWOOD, ISAAC R., an American public official, born at Stanford, N. Y., in 1835. He was educated at Antioch College, Ohio, and the Ohio Law College, Cleveland, Ohio. He served in the Civil War, entering the army as a private, and eventually rising to the rank of brigadier-general of volunteers. From 1869 to 1873 he was secretary of state of Ohio; from 1873 to 1875, he was a member of the 43rd Congress from the 6th Ohio District; and from 1878 to 1884 he was a probate judge. In 1907 he was re-elected from the 9th Ohio District, being re-elected regularly from that time on and serving in the 60th to the 66th (1907 to 1921). At various times, beginning with 1865 and up to 1898, he was successively editor of the Toledo, Ohio, "Commercial"; the Cleveland, Ohio, "Leader"; the Toledo, Ohio, "Journal"; and the Canton, Ohio, "News Democrat." While serving in Congress, he was the author of the Sherwood "Dollar-a-Day Bill" and the "Medal of Honor Bill." He was a member of the G. A. R., and of the Loyal Legion.

SHERZER, JANE, an American educator, born at Franklin, Ohio. She was educated at the universities of Jena, Zürich, Michigan, Paris, and Berlin, receiving the degree of A.M. and Ph.D. from the latter institution, in 1902. From 1882 to 1895 she was principal of the Franklin, Ohio, high school; from 1889 to 1891 instructor of English, and from 1892 to 1894, dean of Oxford College; from 1895 to 1899, principal of the Academy for Young Women, Jacksonville, Ill.; from 1903 to 1904, professor of English philosophy and dean of women, Illinois College, Jacksonville, Ill.; and from 1905

to 1917, professor of English and president of Oxford (Ohio) College for Women. Besides contributing letters of travel and editorial articles to newspapers, she published "The Ile of Ladies" (1902).

SHETLAND, or ZETLAND ISLANDS (Old Norse, Hialtlandia, "the viking's land"), a group of over 100 islands (of which 30 are inhabited) lying N. N. E. of the Orkney Islands (formerly included in the same county); area, 551 square miles; pop. (1918) 26,300. The principal are the Mainland (60 miles long, but narrow); N. E. of it Yell (20 miles by 6), Unst (11 miles by 6); Fetlar, Whalsay, and Bressay. The lonely islands of Foula, 20 miles W. of Mainland, and Fair Island, 25 miles S. of it, are also included in the group. The rocks are chiefly Silurian, highly metamorphosed, resting on Laurentian gneiss, and covered in the S. by fragments of the Old Red Sandstone which characterizes the Orkneys. The coast line of the islands is rocky and precipitous and much indented; their surface is rocky and bare. The highest summit is Rona Hill, 1,590 feet high, in the N. of Mainland; Foula Island attains a height of 1,400 feet.

The scenery of the islands is very grand. The climate is humid and mild, but severe storms rage during winter. It seems peculiarly healthy for the natives, who frequently attain a great age.

The chief occupation of the Shetlanders is fishing. Cod, ling, tusk, saithe or coal fish, and herring are caught in great numbers. The bottle-nosed whale and seal are also hunted. Most of the fishermen possess also small crofts of land, on which they raise oats, bere, turnips, and potatoes. The group produces peculiar diminutive breeds of horses, cattle, and sheep. The ponies, called "shelties," are remarkably sure-footed. They were formerly regarded as common property and ran wild on the moors. Many are exported for use in coal mines. The women spend much of their time in knitting, and Shetland hosiery has long been famous. Though a variety of minerals are found in small quantities, chromate of iron is the only one obtainable in quantities worth exporting. The chief town is Lerwick, 100 miles N. of Kirkwall. The only other towns are Hillswick and Scalloway. The chief antiquities are the ruins of Scalloway Castle and of numerous so-called "Pictish" towers, the chief being Mousa, 12 miles from Lerwick.

The Shetland Islands were early peopled by Northmen, and along with the Orkneys were attached to the kingdom of Denmark. Robert St. Clair, Earl of Orkney, held them under the kings of Denmark. In 1469 they were attached to Scotland as dowry of Margaret of Denmark, James III.'s bride. After passing through the hands of various noblemen they were sold in 1766 to Sir Lawrence Dundas, in whose family (the Earls of Zetland) they still remain. Old Norse customs long survived, and are not yet quite extinct, but the English language is now universal. A rich though little-wrought vein of folklore is indicated by the survival of many curious incantations or spell songs, which bear the impress of Odinic origin. A transfigured relic of an Eddic lay—a fragment of Odin's Rune song in a Christianized version—from the lips of an inhabitant of Unst, was received by Karl Blind in 1877.

SHETLAND PONY, a very small variety of the horse, with flowing manes and tails, peculiar to Shetland.

SHIBBOLETH (properly Shibbo'leth, Hebrew, "ear or corn," or "stream"), the test word used by the Gileadites under Jephthah after their victory over the Ephraimites, recorded in Judges xii. 6. The latter could not pronounce the *sh*, and, by saying *sibboleth*, betrayed themselves, and were slaughtered at the ford. All those Hebrew names in the Old Testament which commence with the *sh* have now, through the inability of the Septuagint to render this sound in Greek, become familiar to us, through the versions that flowed from it, as beginning with the simple *s*—*e. g.*, Simon, Samaria, Solomon, Saul, etc. The word shibboleth is still used to mean a test of opinions and manners.

SHIEL, LOCH, a fresh-water lake in Scotland, on the boundary between Inverness-shire and Argyleshire. It is about 15 miles long, but extremely narrow. It discharges by the river Shiel, which flows 3 miles N. W. to the sea at Loch Moidart.

SHIELD, a portion of defensive armor held by the left hand or worn on the left arm to ward off sword strokes or missiles. The earliest known shields date from the close of the Bronze Age. They are circular and flat, or but slightly convex, with a central boss, under and across which the handle is fixed. The Greek shield of the Homeric period was also of bronze, circular, convex, and often ornamented with devices. The Etruscan shield of bronze, of which there is a fine specimen in the British Museum, is also circular and ornamented in concentric bands of embossed work round the central boss. The Roman infantry used a light round shield about three feet in diameter, and the cavalry carried a smaller buckler also of a round form covered with hide,

while the spearmen had a large oblong convex shield of wood and leather strengthened with iron, which covered the whole body. The early Germanic shields were also large, oblong, and convex.

The shields of the Anglo-Saxon invaders of England and of the Scandinavian Vikings were mostly circular. But the Norman shield of the 11th century was kite-shaped, and the triangular form continued to prevail till the 15th century, becoming gradually shorter and more obtusely pointed, or heart-shaped. After the 14th century the small round buckler came into fashion, and retained its place till the 16th century. By this time the use of firearms had made the shield practically useless in warfare. Many savage tribes still use shields of wood or hide.

SHIELDS, JAMES, an American military officer; born in Dungannon, Ireland, in 1810; came to the United States in 1826; became a lawyer; served through the Mexican War, and was brevetted major-general for gallantry at Cerro Gordo and Chapultepec. He was elected to the United States Senate from Illinois in 1849, and from Minnesota in 1858. When the Civil War broke out, he volunteered and entered the Federal service. He commanded the division which defeated "Stonewall" Jackson near Winchester, March 23, 1862; was defeated in an engagement with the Confederates at Port Republic, June 9, 1862; and resigned his commission in 1863. He died in Ottumwa, Ia., June 1, 1879.

SHIELDS, JOHN KNIGHT, an American public official, born at Clinchdale, Tenn., in 1858. He was privately educated and after studying law, was admitted to the bar in 1879. From 1892 to 1894 he was chancellor of the 12th Chancery Division of Tennessee, and from 1902 to 1910 was associate justice of the Supreme Court. He acted as chief justice from 1910 to 1913. In the latter year he entered the United States Senate. He was re-elected in 1918.

SHIELDS, SOUTH, a municipal and parliamentary borough of England, in the county of Durham, near the mouth of the Tyne, opposite to North Shields, in Northumberland (pop. about 10,000), and communicating with it by steam ferry. The industries comprise glass, earthenware, alkali and chemicals, cordage, steam engine boilers, and chain cables and anchors, besides shipbuilding. The ports of North Shields and South Shields, formed by an expansion of the river into a wide bay, have been greatly improved and deepened by dredging and the construction of piers, and are capable of containing vessels of any size at their quays. Pop. (1919) 116,152.

SHIGATZE, or DIGARCHI, a town of Tibet; on the Sanpo or Brahmaputra river; 140 miles W. by S. of Lhassa, at an altitude of 12,000 feet. Nearby is the great monastery (3,500 monks) of the Tashilunpo, the residence of one of the Tibetan incarnations of Buddha.

SHÎITES (also SHEEAHS; "sectaries," from the Arabian *shîah*, "a party"), the name given by orthodox Muslims or Sunnites to Ali's followers, who call themselves *al-adeliyyah*, "the right people." They were the champions of Ali's right to be Mohammed's successor as being his cousin and son-in-law; and after Ali's death they took the side of his sons Hassan (Hasan), Hussein (Hosaín), and Mohammed ibn al-Hanafiyyah. The Persians, believers in the divine right and even in the divine nature of kings, took this side. All Shîites allegorize the Koran; but the ultra Shîites, founded by Abdallâh ibn Sabâ, a converted Jew of Yemen, differed from the moderate Shîites or Zaidites in believing in the transmigration of souls, and in calling Ali and his legitimate successors incarnations of God. By Shîite help the Abbâsides in 750 wrested the caliphate from the Ommiades. Yet, unsound as the Abbâsides were, and decided as Persian ascendency was for 100 years, the Shîites gained little. They were the strength of the "veiled prophet" in 770-779 and of Bâlek in 817-837. Their disaffection was one chief reason for the introduction of Turks into the caliph's service (830-840).

In 765 the death of Jaafar the Veracious, the Sixth Shîite Imâm, developed the Ismaîli sect of the Shîites. Those followed the eldest son Ismael; the majority, following Moosâ, the second son, were afterward named Twelvers, the series of their Imâms ending with the 12th. In Irâk in 887 arose the Karmathian branch of the Ismaîlis. In 909 an Ismaîli proclaimed himself in north Africa as the first Fâtimide caliph. The 6th caliph of this line, Hâkim, was declared to be God's 10th and final incarnation by Darazi, who founded the sect of the Druses. In 1090 Hassan Sabbâh, an Ismaîli of Khorassân, as the Sheikh of the Mountains instituted the order of Assassins, who generally recognized the Fâtimide caliphate. Ismaîlis are still found in Persia and Syria. The moderate Shîism, that has been the national religion of Persia since the native royal line of Safiides ascended the throne in 1499, is more Koranic than Sunnism. It has Hadîth and Sunna, but not those of the orthodox Muslims. It has its own modes of religious washing, and its own postures in prayer.

Shîites, habitually ill-used in Arabia, absent themselves much from Mecca, and, unable to bless Abu-bekr and Omar, who are buried in Medina, go still less thither. But they do pilgrimage unhindered to the tombs of Ali and Hussein in the pashalic of Bagdad, and to the tomb of Riza, one of their 12 imâms, in Meshhed, the capital of Khorassan, and to the tombs of Shîite saints. They keep the orthodox feasts and others, among which the Moharram feast, occupying the first 10 days of the month Moharram, and commemorating the martyrdom of Hussein, is the chief. They detest Ayeshah and the founders of the four orthodox schools, and hold all caliphs save Ali to have been usurpers. They own no caliphate nor imâmate; these have been dormant since the death of Mohammed, their 12th imâm, in 879, but shall be revived in him when he, the Hidden Imâm, reappears as the Mahdi. Shîism, the ancient protest of Persian patriotism against Arabian ascendency, has spread through Afghanistan into India, but toward the W. has made no way. The Shîites, divided and subdivided into sects, number 10,000,000, most of whom are Aryans. Toleration and free thought are common in towns and among the more cultivated Persians. In 1736 Nâdir Shah tried but failed to restore the Shîites to orthodoxy.

SHIKARPUR, an important trading town and capital of a district in the N. of Sind, India, 18 miles W. of the Indus, on the railway leading to Quetta and Pishin. Before the opening of this railway it was a place of very considerable commercial importance, owing to its situation on one of the principal routes between India and Khorassan—viz.: that by the Bolan Pass. It occupies a very low site, the adjacent country being often inundated, but the soil is extremely fertile and yields heavy crops of grain and fruits. Carpets, coarse cottons, furniture, baskets, etc., are made in the town. Pop. about 54,000.

SHILKA, a river of Eastern Siberia; rises in the Trans-Baikal region, among the Yablonoi mountains, and after a N. E. course of 260 miles falls into the Amur, a little beyond Ust Strelka. It is navigable for boats to the foot of the Yablonoi mountains, and is historically interesting as the "point of departure" for the Russians in their conquests on the Lower Amur.

SHILLABER, BENJAMIN PENHALLOW, an American humorist; born in Portsmouth, N. H., July 12, 1814; was best known as the author of the popular sayings of "Mrs. Partington." He was connected with the "Boston Post," the "Saturday Evening Gazette," and other periodicals, and wrote: "Rhymes with Reason and Without" (1853); "Life and Sayings of Mrs. Partington" (1854); "Mrs. Partington's Knitting Work" (1857); "Partingtonian Patch-Work" (1873); "Lines in Pleasant Places" (1874); "Ike Partington and His Friends" (1879); "Cruises with Captain Bob" (1880); "The Double-Runner Club" (1882); etc. He died in Chelsea, Mass., Nov. 25, 1890.

SHILLING, an English silver coin and money of account equal to 12 pence, or the 20th part of a sovereign or pound sterling; and equivalent in the United States to about 24⅓ cents. In the United States, a denomination of money formerly in use, differing in value relatively to the dollar in different states, but below that of the English shilling. York shilling, a designation given in some parts of Canada to a silver sixpenny piece or English sixpence.

SHILOH, a town of the tribe of Ephraim, the first permanent resting-place of the Tabernacle; the home of Eli and Samuel; and long the religious center of Israel. The site is well ascertained—a ruinous village hidden among the hills 20 miles N. of Jerusalem.

SHILOH, BATTLE OF, one of the most memorable battles of the American Civil War. Shiloh was a locality in Hardin co., Tenn., near Pittsburgh Landing, on the Tennessee, and 88 miles E. of Memphis. It took its name from a log chapel known as "Shiloh Church." The battle was fought on April 6 and 7, 1862, Grant and Sherman leading the Federals, and Albert S. Johnston and Beauregard the Confederates. The first day the Confederates, taking the Federals by surprise, drove them from their lines with heavy loss in men and guns; but the second day the Federals, having received reinforcements under Buell, and largely outnumbering the Confederates, regained their lines, and forced the Confederates to retreat to their former position at Corinth. General Johnston was killed on the first day. The Federal loss was placed at 13,573; the Confederate at 10,699.

SHIMONOSEKI, a town of Japan, at the S. W. extremity of the main island and the W. entrance to the Inland Sea; declared a seaport open to foreign traders in 1890. The batteries and a part of the town itself were destroyed during a bombardment by a combined English, French, Dutch, and American fleet in 1864. Here the peace between China and Japan was negotiated after the war of 1894. Pop. (1918) 67,866.

SHINGKING, or **SHENGKING**, or **FENGTIEN**, a province of Manchuria. Its area is 56,000 square miles, and though smaller than the other provinces of Manchuria, it is the richest and most important. It contains the Shan-a-lin mountains and the rivers Liao, Tayang, and Yalu Kiang. The industries are agriculture, cattle-raising, and mining. Tobacco, opium, wheat, millet, cotton, and oil are among the products. There are good roads and two railways. Chief ports: Port Arthur (*q. v.*), Talienwan, and Newchwang (*q. v.*). Capital, Mukden. Japanese influence succeeded Russian in the province in 1905. Pop. about 5,500,000.

SHINGLES, a popular name for an eruptive skin disease, *Herpes zoster*, which usually starts from the backbone and goes half round the body, forming a belt of inflamed patches with clustered vesicles. It is sometimes produced by sudden exposure to cold after violent exercise, and sometimes follows acute affections of the respiratory organs. It is a self-limited or cyclical disease, usually running its course in about a fortnight.

SHINN, CHARLES HOWARD, an American forester, born in Austin, Tex., in 1852. He was educated at the University of California, and Johns Hopkins University. From 1879 to 1889 he taught school and engaged in newspaper and magazine work in San Francisco, Baltimore, and New York. In 1902 he became agent and expert of the United States Bureau of Forestry, and successively served as head forest ranger, Department of the Interior; supervisor of the Sierra National Forest, California; and forest examiner, district five. He was a member of various domestic and foreign arboricultural and horticultural societies. He published, besides many papers, reports, articles, and monographs on forestry, social science, and literary topics, "Land Laws of Mining Districts" (1884); "Mining Camps" (1885); "Co-operation on the Pacific Coast" (1888); "Story of a Mine" (1890). He also acted as associate editor of Bailey's Standard Cyclopædia of American Horticulture" (6 volumes).

SHINN, EVERETT, an American artist, born in Woodstown, N. J., in 1873. He studied art at the Pennsylvania Academy of Fine Arts, Philadelphia, and in Paris, where he was influenced chiefly by Degas. At first devoting himself to working in pastel colors, he later gained rapid recognition for his mural paintings and magazine illustrations. The most important of the former are to be found in the Trenton, N. J., city hall, in several New York City theaters, and in numerous private residences. He was a frequent exhibitor in general exhibitions, and has also, at various times, held exhibitions of his own work exclusively.

SHINTO, from a Chinese word, meaning the way of the gods, the religious belief of the people of Japan prior to the introduction of Buddhism from Korea in A. D. 552. The new belief almost entirely absorbed the old, being, however, itself modified in the process. Shinto possesses no moral code. Motoöri (1730-1801) maintained that the will of the Mikado was the criterion of right and wrong. Shinto holds the Mikado to be the direct descendant and representative of the Sun goddess; has associated with it a system of hero worship, and attributes spiritual agencies to the powers of nature. Also, a Shintoist.

SHIOGOON, or **TYCOON**, the title of the hereditary military ruler of Japan for many centuries till the revolution of 1868, which reinstated the Mikado in power. See JAPAN.

SHIP, in the most general sense, a vessel intended for navigating the ocean. In contradistinction to boat, which is the most general term for a navigable vessel, it signifies a vessel intended for distant voyages. Ships are of various sizes, and fitted for various uses, and receive various names, according to their rig and the purposes to which they are applied, as man-of-war ships, transports, merchantmen, barks, brigs, schooners, luggers, sloops, xebecs, galleys, etc. The name as descriptive of a particular rig, and as roughly implying a certain size, has been used to designate a vessel furnished with a bowsprit and three or four masts, each of which is composed of a lower mast, a top mast, and a top-gallant mast, and carrying a certain number of square sails on each of the masts. These masts are named, beginning with the foremost, the fore, the main, and mizzen masts; and when there is a fourth it is called the jigger mast. The principal sails are named according to the masts to which they belong.

There were two primitive types of shipbuilding from one or other of which, or rather perhaps from a joint development of both, all the improvements of modern times have proceeded. These were the raft and the canoe. In like manner there have been from time immemorial two distinct modes of propulsion, by oars and sails.

The ancient art of ship-building, like many other arts, was lost in the overwhelming tide of barbarism which overthrew the last of the great empires of antiquity.

Shipbuilding made little progress in

Europe till the discovery of the compass, which was introduced in a rude form in the 12th century, and had been improved and had come into common use in the 14th century. The opening up of the passage to India and the discovery of America made another epoch in its progress. In the building of large vessels the Spaniards long took the lead, and were followed by the French, who specially distinguished themselves in the theoretical study of the art. In the early progress of the art of shipbuilding the English took little or no part. When Henry VII. built the "Henri Grace a Dieu," which is regarded as the parent of the British navy, the English were greatly inferior to the nations of southern Europe both in navigation and in shipbuilding. In the reign of Elizabeth the English fleet proved its superiority to that of Spain in respect of fighting capacity, but it was afterward rivaled by that of Holland. The first three-decker was built in England in 1637. She was called the "Sovereign of the Seas" and was deemed the best man-of-war in the world. In 1768 the French adopted three-deckers.

In the early part of the 19th century the lead in improvement was taken by the United States. English builders were at first skeptical as to American improvements; but in 1832 Scott Russell theoretically established the principles on which speed in sailing depends—principles which had already been practically applied not only by the Americans, but by the Spaniards. From the time of their theoretical establishment they were rapidly adopted in England, and a race of improvements began between Great Britain and the United States. The true principles of construction both in build and rig were exemplified in the celebrated Baltimore clipper schooners, which were sharp in the bow, deep in the stern, of great length, and lying low in the water, with long, slender masts, and large sails cut with great skill.

A great change came over the art of shipbuilding when steam was introduced and wood gave place to iron and then to steel. The first steamer built expressly for regular voyages between Europe and America was the "Great Western," launched in 1837. She was propelled by paddles, but about the same time Ericsson invented his screw propeller, which was soon adopted in sea-going ships, and the British Admiralty possessed a screw vessel in 1842. Iron vessels were built early in the 19th century for canal service, then for river service, and later for packet service on the coasts. In 1838 the first vessel of this material was built for ocean service, but the first ocean-going steamship in its present form, built of iron and propelled by the screw, was the "Great Britain," launched in 1843. As early as 1855, iron was substituted for wood in the yards on the Clyde; and on the Mersey, the Tyne, and the Wear, iron shipbuilding was in general adoption by 1863 or earlier. Puddled steel was used as early as 1862, and since 1870 Great Britain has led the world in steel shipbuilding. Before 1890 steel had displaced iron in British shipyards.

In the United States, the transition from wooden to iron ships took place at the commencement of the Civil War. Among the shipbuilding yards that survived the change was Cramp's at Philadelphia, and the Harlan & Hollingsworth Co., at Wilmington, Del. Though the building of merchant vessels was interrupted (allowing England to acquire the leadership she still maintains), the American shipyards promptly turned out warships. The "New Ironsides," a pioneer type for coast service, was built at Cramp's yards and went into action at Fort Sumter. The lack of efficient yards in the Confederate States was an important factor in the Civil War.

The "St. Louis" and the "St. Paul," two ocean liners built by the Cramp Co. between 1892 and 1896, were constructed entirely of domestic material, thus marking a new era in American shipbuilding. American yards now receive orders not only from foreign firms for merchant ships, but from foreign governments for warships.

During the World War and especially after the United States joined the Allies in 1917, there was a great increase in shipbuilding. In 1919 the sailing vessels (exclusive of canal boats and barges) of the United States, numbered 4,260, tonnage 1,199,661; steamships 7,397, tonnage 10,027,400; gas vessels 10,254, tonnage 358,257; including canal boats and barges 27,513, tonnage 12,907,300. See SHIPBUILDING; SHIPPING; NAVY; etc.

SHIP, ARMORED. The earliest plans for the building of armored steamships appear to have been made by John Stevens of New Jersey in 1812. The idea did not then take practical shape but it was developed by his son, Robert L., who secured acceptance by the United States Government of a plan for the construction of an ironclad steamship in which all the machinery would be below the water-level. The keel was laid in 1854, but the French meanwhile produced the "Gloire," which, speedily followed by the sister ships "Invincible" and "Normandie," was the first ocean-going ironclad. In 1861 the United States provided for the building of the "Galena," "New

Ironsides," and the famous "Monitor," each of which had distinctive features, which included inward-inclined sides, ram bows, retreating sterns, coverings of iron plate, and powerful batteries. The "Monitor" was really a floating battery, unsafe at sea, and her usefulness was proved in the fight with the "Merrimac" in the Civil War. Progress from that time on was marked by a development that alternated between the turret ship and the ship fitted for broadside fire from many guns. Italy, France, and Great Britain built both turret ships and broadside and central battery ships, and in the seventies a definite return was made by Italy and Great Britain to the turret ship with thick armor, central citadel, and battery of heavy guns. The caliber of the auxiliary guns was increased till the British in 1906 finally evolved the dreadnaught. This new type involved a concentration of force which made many other vessels obsolete. Turbine engines were introduced, the speed increased, and the principle of single caliber guns was adopted in all the great navies. The first battleship laid down in the United States was the "Texas" in 1889, and the improvement was uniform till the building of the "California" and "Oklahoma." The British super-dreadnaught "Queen Elizabeth" represented the utmost concentration of power during the World War, and its work in the Dardanelles in February, 1915, was an interesting exhibition of relative power between naval guns and land guns.

SHIPBUILDING. The development of shipbuilding is represented in its main stages by the evolution of the hull and the introduction of the machinery of propulsion. The first carries us back almost to the prehistoric period and to an idea as simple as the floating log. The line of development through the raft, the hollowed-out trunk, the boat of skins stretched on frames, and the vessel of planks tied together brings us finally to the wooden and iron ship of modern times. From very early times the idea of the oars and the sail had already been evolved. Early Egyptian drawings show vessels of sawn planks with sails and oars. The Greeks and Romans enlarged the size of their vessels, but they still remained dependent on man-power. In mediæval times Irish mariners sailed in vessels propelled by sails and oars to the Faroe Islands and Iceland, which they discovered, and Columcille at Iona commanded fleets of vessels which passed constantly between Iona, Derry, and other Irish ports. Ships remained dependent on sails and man-power for propulsion down to modern times, but the arrival of steam engines resulted in a general awakening of the possibilities that lay in natural forces and shipbuilding, like other mechanical arts, took an upward bound. The general shape of vessels had to be modified to the new methods of propulsion, and gradual perfection was reached. Attention was given in the changed circumstances to greater stability and speed, simplicity was sought in the mechanical apparatus, and the structural arrangement was developed to secure greater habitability. The substitution of iron for wood and of steel for iron had reference not merely to increased resistance and durability and safety from combustion but also to the reduction of weight of hull in proportion to weight of lading. The investigation of the effect of the shape on buoyancy, speed, range of stability, and righting ability resulted in a certain standardization which has eliminated former dangers, so that safety at sea is now as procurable as on land. The naval architect drafts his plans on paper, and embodies parts of the vessel in wooden models. Molds are then laid by the constructive force. When these are completed actual construction begins with the preparation of the building way along keel blocks. On these the keel is laid, in sections, riveted together and fastened to the stern and stern posts. The midship frames are then set up, being held by a vertical internal keel till the forged stern and stern posts and the complementary plating are put in and the form of the ship is completed.

After the launching the machinery is put in and the interior supplementary fittings are added. The reciprocating engine long held the field, but in recent years the development of turbine engines displaced the older type while the use of oil and the Diesel engine has produced motor vessels of the largest displacement as the latest type of all. The enormous expansion in shipbuilding has now also entailed the introduction of an immense variety of auxiliary machinery and appointments so that a modern transatlantic liner has come to partake of the character of a floating city. The building of naval vessels is, of course, differentiated from the building of passenger and cargo ships in many essential ways, but the actual ship is fundamentally the same, and the differences lie in the purposes of the parts, such as machinery, guns, and armament, added to it. See SHIPPING.

SHIP CANALS. See CANAL.

SHIPKA PASS, a pass in the Balkans, 47 miles N. E. of Philippopolis, about 4,600 feet above the sea, the scene of a desperate and bloody 10 days' struggle during the Russo-Turkish War (1877).

In his futile endeavors to take Fort Nicholas at the summit of the pass from the Russians, Suleiman Pasha lost 20,000 of his best men.

SHIPMAN, LOUIS EVAN, an American author and playwright, born in Brooklyn, N. Y., in 1869. He was educated at Brooklyn Polytechnic Institute and Harvard University. From 1895 to 1896 he was an editorial writer on "Leslie's Weekly" and from then on contributed frequently to "Life" and "Collier's Weekly," as well as to other magazines. He wrote: "Urban Dialogues" (1896); "A Group of American Theatrical Caricatures" (1898); "D'Arcy of the Guards" (1899); "Predicaments" (1899); "The Curious Courtship of Kate Poins" (1901); "The Quality of Youth" (1904); and "The True Adventures of a Play" (1914). Of his plays, the best known are "D'Arcy of the Guards" (1901); "The Crisis" (with Winston Churchill, 1902); "The Crossing" (with Winston Churchill, 1905); "The Admiral" (1909); "The Grain of Dust" (1911); and "The Fountain of Youth" (1918). During the World War he served as a member of the New Hampshire State Commission of Public Safety, state director of the "Four-Minute Men," and local food administrator.

SHIP MONEY, an impost levied at various times in England, especially on the seaports for the purpose of furnishing ships for the king's service. Having lain dormant for many years, it was revived by Charles I., who in 1634 levied it on the coast towns, and in 1635 issued writs for ship money all over the kingdom. The tax met with strong opposition, and the refusal of John Hampden to pay the $5 at which he was rated was one of the proximate causes of the civil war.

SHIPPING. The use of ships and shipping, using the words in the large sense, goes back very early in the history of civilization. Ships figure in the earliest records of the Egyptians, Chaldeans, Chinese and Hindus. The inhabitants of the Nile Valley constructed vessels capable of carrying large cargoes or half a hundred persons some 4,000 years before the Christian era. It is probable that even at that early time the principles of the oar and the sail had become known and put into practice. By the time the Phœnicians dominated in the Mediterranean, the use of the oar and the sail had been developed and vessels of large size had become numerous. Little improvement was discernible in the craft that sailed the seas during the period of the Greeks and Romans. It can well be imagined that in the case of a people, in whom the sense of beauty was so highly developed as in the Greeks, vessels in their day must have had very distinctive features. The actual form of the vessel could not necessarily be subjected to much variation. Space, speed and seaworthiness had to be the governing principles alike in the case of the primitive Egyptian and the highly cultivated Athenian, but such representations as exist of the craft both of the Greeks and the Romans show that the greatly developed artistic sense, exhibited in the case of almost every object in the world of classical antiquity, found an outlet also in the building of ships. From the time of the Greeks and Romans to the sixteenth century, when voyages around the world became the vogue, the improvement was not very considerable. The stern and bow rising sheer out of the water had been retained and a hundred feet seemed to be the limit in length from the point of view of safety. The discovery of America and of the way to India round the Cape of Good Hope awakened the desire for vessels of a larger type and of greater speed, and immense activity was expended in construction so that some of the largest sailing vessels attained a length of 200 feet and were carried forward with an immense spread of canvas. The high bows and sterns were retained, but the hull was modified. The proportion of beam to length was about one to four. Differences were made between merchant vessels and war vessels, but as in those days a merchant vessel on the ocean might be called on at any time to defend itself from pirate ships the differences were not great.

As long as ships relied on the sail as a driving agent progress could not necessarily be other than slow, but with the arrival and development of steam engines it took an immense step forward. Sailing ships came to be regarded as useless as a fighting unit. As in the case of almost everything new, the advent of steam so far from immediately displacing the sail, aroused the older method to new activity. In the sailing vessel every other consideration was abandoned in the effort to compete with steam in the attainment of speed. As a result the best clipper ships were able to make long voyages at a pace rivaling that of the steamer. The voyage between New York and Liverpool was cut down to thirteen and fourteen days, when the fast mail-steamer passage took ten days. The type of sailing vessel has since varied according as to whether speed or carrying capacity was desired. Steel has displaced wood in the more modern sailing ships, but the total displacement of the sailing vessel by the steamer for utilitarian purposes appears only a

matter of time, though a combination of sail and steam or oil power may delay the inevitable end.

There had been many experiments in the direction of using steam as the driving power for boats before Watt took out his first patent in 1769. The earliest authentic case seems to have been that of Professor Denis Papin of Blois who in 1707 built a steamboat which he navigated on the river Fulda. Watt, whose engines were single-acting pumps, suggested in 1770 their use for propelling vessels. In 1782 he brought out the double-acting engine and improved the principle of its working by cutting off the steam at a point fixed by experiment instead of allowing it to complete the stroke. This development by Watt brought into existence the engine needed for propulsion and from that time forward the development of the steamer was only a matter of time. In 1784 and after, James Rumsey put on the water at Berkeley Springs, Va., a number of small boats, which, by the ejection of water through a tube at the stern, attained a speed of over four miles an hour. In 1788 a boat made by James Fitch with paddles at the stern made a trip from Philadelphia to Burlington, a distance of 20 miles, in a little over three hours. Fitch in 1789 built a larger boat with side paddles that made a speed of eight miles per hour and was made a passenger and freight boat on the Delaware river in 1790.

While Fitch was making his experiments, Patrick Miller, a banker of Edinburgh, succeeded in developing at Dalswinton in Dumfriesshire a paddle boat driven by steam-power, which attained a speed of 7 miles per hour on the Forth and Clyde Canal. In 1801 Symington, the engineer of Miller's boat, built for Lord Dundas a steamer for towing barges with machinery very highly developed for the time. In Salem, Mass., Nathan Read in 1791 patented the multitubular boiler and built a successful paddle-wheel steamboat. John Stevens and Oliver Evans were making successful experiments about the same period. A boat built by Stevens in 1804 had twin screws. His steamboat "Phœnix" carried passengers on the Raritan river between New Brunswick and New York City, and later navigated the Delaware for six years.

New possibilities were opened up with the appearance of the "Clermont" built by Robert Fulton. In 1797 Fulton went to France and experimented with submarine torpedoes and torpedo boats. In 1801 he built a small steamer and in 1804 procured from Watt in England machinery for a large vessel which was built in New York and launched in 1807. This was the famous "Clermont." From New York City she navigated the Hudson to Clermont, 110 miles away, and 20 hours later went to Albany. On the following day she began her return trip to New York City, and covered the distance in 30 hours at an average speed of five miles an hour. After an interval of a month she started running regularly between Albany and New York. This marked the start of steam navigation as a commercial undertaking. From that time forward the building of steamboats increased rapidly. The United States took the lead, but other countries were not far behind. The Dublin-Holyhead line began in 1819 and in the following year a beginning was made with the Calais-Dover service. The "Savannah," a vessel built in the United States, was the first steamer to cross the Atlantic. She had a length of 100 feet, and a displacement of 350 tons, and she crossed from Savannah to Liverpool in 25 days. She was provided with sails and these were used when the wind was favorable. When the sea was smooth the paddle wheels were used and during an unfavorable sea they were taken on deck. In 1828 the steamer "Curaçao," built in Holland, successfully navigated the Atlantic and she was followed in 1832 by the Canadian "Royal William." The "Sirius" and "Great Western" registered a great step forward. Both started in April, 1838, arriving in New York in the same month within a day from each other. The "Great Western" averaged 208 miles per day and at her topmost speed she averaged 247 miles. She continued running as a regular transatlantic vessel, and may be said to have initiated the transatlantic steam service. It was left, however, to Samuel Cunard to make the service a paying commercial proposition. In 1839 he established the Cunard line with the help of a government subsidy. The Cunard line carried the bulk of the freight, passengers, and mail for ten years and was almost without a competitor till the Inman and Collins lines were started. The loss of a subsidy from the United States Government obliged the Collins line, which was purely American, to withdraw in 1858 after the service had been continued for eight years. In 1850 two other American lines, the Vanderbilt line and the New York and Havre Steamship Company, were started and both of them continued to run till British competition during the Civil War swept American commerce from the seas. The Inman line from the beginning used vessels of iron propelled by screws, and its example was followed by the Cunard line, with which the screw gradually displaced the paddle wheel. The building of the "Princeton" by

the U. S. Navy, had proved the availability of the screw, the chief advantage of which was getting the propelling machinery below the water line. The development of the propelling machinery responded to the demand for increased speed and the tricompound and triple-expansion engine was evolved. The evolution of the water-tube boiler led to the quadruple-expansion engine until at last the turbine and similar forms of steam and internal combustion engines brought the development of steam-shipping to the modern types in transatlantic service.

From the middle of the last century the transatlantic service has naturally led in the development of shipping, size and speed being in nearly every case the governing considerations. Vessels like the "Germanic" have marked the milestones of progress reducing to about eight days the average length of passage between New York and Queenstown. The "Mauretania" and the "Lusitania" showed the development of a generation, reducing the voyage in favorable weather to about five days. The White Star Line led the way in the development of vessels of large dimensions. The "Olympic" (46,000 tons) launched in 1910, marked the high water mark, and this was outclassed by the Hamburg-American "Imperator" (52,000 tons) in 1913. The World War had the result of retarding the construction of great passenger vessels, but the intensive competition in warship building had its bearing on commercial steamship service. As a result of the larger knowledge furnished by the experiences of the war, oil-burning vessels are likely to be the predominant type of the near future, and the scramble for oil-lands by the great nations is largely occasioned by future needs in that direction.

A development of the war is the United States Shipping Board which was authorized by Congress in 1916 with power to investigate, regulate and fix the rates in United States marine business. The board has authority to issue bonds not exceeding $50,000,000 to build, purchase or lease vessels for a merchant marine. It constitutes the head of a corporation to endure for a period not to exceed five years after the war. The annual salary of the members of the board was fixed at $7,500. During the war the Board operated the merchant marine as a national enterprise. As a result American shipping has promised to be as important in peace as in war. The decisive manner in which the United States entered the world of shipping during the war has awakened the most sanguine hopes of those interested in the development of an American mercantile marine, and legislation looking to the promotion of American shipping is looked for under the new Republican administration.

SHIPPING BOARD, UNITED STATES. See SHIPPING.

SHIPPING SUBSIDIES, financial aid to shipping by public authority. Great Britain appears to have led the way in this manner of promoting shipping service, Parliament in 1730 providing for a bounty of 20 shillings per ton on vessels of 20 tons and more employed in the white-herring fisheries. In 1839 the British Government also granted a subvention to the Cunard Company as a recompense for the carrying of postal matter, between Canada and Liverpool. The amount, beginning with £60,000, was gradually increased, finally being made to depend on the weight of mail matter carried. By methods such as these the British succeeded in building up their merchant fleet and in driving from the high seas the American clipper lines which previous to these subsidies had won much of the ocean-carrying trade. In addition subsidies have also been paid by the British Government for the option of buying or hiring certain speedy Cunard and White Star steamers in time of war. The policy of granting subsidies to ships has been followed by other European countries, though various methods have been employed. Germany paid an annual subsidy for the East Asian service, and other subsidies were paid the North German Lloyd for other services. Indirect subventions were paid also in the form of exemption from import duties. France also voted mail subsidies which amounted in 1914 to $6,030,000. Italy paid subsidies in aid of construction and navigation amounting in 1912 to $2,000,000.

The United States has followed no settled policy in the granting of shipping subsidies, though in 1845 it began to pay for the transportation of mails by ships. The abrogation of contracts for carrying of mails in 1858 by the United States Government brought about the failure of the Collins line which till that time had competed favorably with the Cunard. The abrogation of similar contracts later brought about the failure of the Pacific Mail Company. Under the Act of 1891 the United States instituted a mileage basis of payment for the carrying of mails, and the subsidies have been paid to foreign as well as to American lines. A general subsidy measure was introduced in Congress in 1898, but failed to pass the House. A Senate committee in 1905 recommended a subsidy policy, and its permanent advantages have been gradually recognized in the plans put forward in 1919 for the resurrection of an American merchant marine.

SHIPTON, MOTHER, a half-mythical English prophetess; born near Knaresborough, Yorkshire, in July, 1488. She was christened Ursula Southill. Tradition has it that she was the child of Agatha Shipton and the devil. Some of her alleged "prophecies" have been handed down to us. She became the wife of a shipbuilder, Tobias Shipton, and died about 1559.

SHIRAS, GEORGE, JR., an American jurist, born in Pittsburgh, in 1832. He was educated at Yale University, from which institution he received, besides the degrees of A.B. and LL.B., also the honorary degree of LL.D. Admitted to the Pennsylvania bar in 1856, he practiced law in Pittsburgh until appointed associate justice of the United States Supreme Court in October, 1892, retiring in February, 1913. In 1888 he served as a presidential elector.

SHIRAZ, a city of Persia and capital of the province of Fars; much celebrated in Persian poetry for its climate, its wine and roses, and its beautiful gardens; situated in a broad plain, 115 miles E. N. E. of Bushire and 35 miles S. W. of the ancient Persepolis. It is inclosed by ruined walls, and previous to the earthquakes contained many splendid mosques, bazaars, caravansaries, and other public buildings. The wine of Shiraz, which is very strong and resembles Tokay, is, however, still famous throughout the East. Rose water is prepared in large quantities. Inlaid articles in wood and metal, glass, and woolens are made here. The city was founded in the 8th century, and from its beautiful situation and charming climate became a favorite resort of the Persian princes. In 1812 a destructive earthquake laid a large portion of it in ruins, and another in 1824, which cost the lives of 4,000 of the inhabitants, completed the wreck of its prosperity. It was, however, rebuilt, and numbered 40,000 people, when a third and more terrible visitation, in April, 1853, laid almost the whole town again in ruins, and caused the death of 10,000 people. It has been rebuilt to a considerable extent. The tombs of the poets Hafiz and Sádi, both natives of the town, exist in the vicinity. Pop. about 55,000.

SHIRE, in the United States, a division of a State, comprising several contiguous townships—a distinction must be drawn between the application of this word as between English and American usage; as, for instance, it is correct in the United States to say "the county of Berk*shire*"; whereas in England such an expression would be tautological, or, in other words, would convey the sense of "a county of a county."

SHIRÉ, a river of southeastern Africa draining Lake Nyassa into the Zambesi, which it enters on its left bank after a course of about 270 miles nearly due S. It is navigable throughout its entire length, with the exception of about 35 miles of falls and rapids, during the course of which it descends as much as 1,200 feet.

SHIRLEY, JAMES, an English dramatist; born in London, England, Sept. 13, 1596; went to Merchant Taylors' School, whence he passed in 1612 to St. John's College, Oxford. Laud esteemed him highly, but discouraged him from seeking holy orders. He migrated, however, to Catharine Hall, Cambridge, took orders, and held for a short time a living at or near St. Albans, but becoming a Catholic resigned it, taught school for two years, and then retired to the metropolis, lived in Gray's Inn, and set up for a play maker. For his plots Shirley drew on his own inventiveness. Beaumont and Fletcher were his models, even more than Ben Jonson. Most of his plays are tragicomedies. His chief plays were "Love Tricks" (1625); "The Maid's Revenge" (1626); "The Brothers" (1626); "The Witty Fair One" (1628); "The Wedding" (1628); "The Traitor," his finest and also his strongest tragedy (1631); "The Changes, or Love in a Maze" (1632); "The Gamester," an admirable comedy, (1633); "The Lady of Pleasure" (1635); and "The Cardinal." In 1646 he printed a volume of his poems, including his masque of "The Triumph of Beauty." As a writer of masques he is second only to Ben Jonson. Among his best was "The Triumph of Peace," presented by the Inns of Court before the king and queen in 1633. The only complete edition of his works is that edited by Gifford and Dyce (6 vols. 1833). There is a selection of five plays with "The Triumph of Peace," in the "Mermaid" series, by E. W. Gosse (1888). He died in poverty, Oct. 29, 1666.

SHIRWA, or TAMANDUA, a lake of southeastern Africa, on the Shiré river, to the S. E. of Lake Nyassa. It is a secluded basin, lying at an elevation of 2,000 feet above the sea, and surrounded by mountains which reach a height of 7,000 to 8,000 feet. It is mostly shallow and infested by hippopotami and crocodiles.

SHISHAK, the name of several monarchs of the 22d or Bubastite Egyptian dynasty. Shishak I.'s name is found in the portico built by the Bubastite dynasty at the great temple of Karnak, and on

several statues of the Egyptian goddess Pasht, which probably came from Luxor. Jeroboam fled to Shishak from the pursuit of Solomon, who wished to kill him, and lived there during the lifetime of Solomon. On the death of this monarch Jeroboam quitted Egypt and contended with Rehoboam for the possession of the crown. This struggle caused the division of the kingdom of David into two states, that of Israel and Judah. In the fifth year of Rehoboam Shishak marched to Jerusalem with an army of 12,000 chariots, 60,000 cavalry, and an innumerable number of infantry, composed of Troglodytes, Libyans, and Ethiopians. He took the city, the treasures of the temple, and all the gold bucklers which Solomon had made. The conquest of Jerusalem is found recorded on the monuments of Karnak, on which Shishak I. is represented dragging before the god Ammon three files of prisoners, inscribed with various names of places, among them Judæa, Megiddo, Ajalon, Mahanaim, and other towns taken by Shishak in his line of march.

SHITEPOKE, the small green heron of North America (*Butorides virescens*). The plumage of its crest and upper parts is mainly glossy green; the under parts are brownish-ash, varied with white on its belly. Also called poke and fly-up-the-creek.

SHITTIM WOOD, the wood of the shittah tree of the Bible, of which the tabernacle in the wilderness was principally constructed, is supposed to be the *Acacia seyal* of the Sinaitic peninsula. It is a light but cross-grained and enduring wood, of a fine orange-brown color.

SHIVELY, BENJAMIN FRANKLIN, a United States Senator from Indiana, born in St. Joseph co., Ind., in 1857. He was educated at the Northern Indiana Normal School and at the University of Michigan. He graduated from the law department of the latter in 1886. He was engaged in farming, and was at various times an editor and teacher. Elected to Congress in 1884 and again in 1886, he served until 1892. In 1909 he was elected United States Senator and was re-elected in 1914. During his services as Senator, he was chairman of the Committee on Pensions and was a member of the Committee on Foreign Relations. He died in 1916.

SHOA, a province in the S. E. of Abyssinia; area, about 26,000 square miles. Pop. about 2,500,000. It consists (like the rest of Abyssinia) mostly of plateaus reaching up to an elevation of 10,000 feet on the S. E. and S., overtopped by higher mountains, and intersected by numerous streams mostly tributaries of the Blue Nile. The capital is Ankober. It also contains Addis Abeba, the capital of Abyssinia. In 1889 Menelek, King of Shoa, became ruler of all Abyssinia, which in 1896 became an independent state. See ABYSSINIA.

SHOCK, in electricity: (1) Frictional, a sensation as of a more or less painful concussion or blow attended by a sudden contraction or convulsion of the muscles, produced by a discharge through them of electricity from a charged body. If a number of persons join hands, the first touching the outside coating and the last the knob of a charged Leyden jar, all will receive a nearly simultaneous shock proportioned to the strength of the charge and the number of persons whom it strikes. (2) Dynamical, the sensation produced in the same way by a current from a charged inductive coil, or from a dynamo-electric machine. Owing to the large quantity of these latter currents, fatal accidents not unfrequently occur. In pathology, a sudden and violent derangement of any organ or of the nervous system, and through it of the general frame, consequent on sudden injury, the sight of anything painful or terrible, or the reception of very startling news.

SHODDY, old woolen or worsted fabrics torn to pieces by a machine having spiked rollers (termed a devil), cleansed, and the fiber spun with a certain proportion of new wool, the yarn being afterward woven into full bodied but flimsy fabric also known as shoddy, and made into cheap cloth, table covers, etc.

SHOE, a covering or protection for the foot, usually of leather. The ancients usually wore SANDALS (*q. v.*). The crescent was employed as an ornament on the shoes of Romans of exalted rank, who appear to have carried on the art of shoe making with great taste and skill. Only one instance is known of an ancient monument exhibiting shoes with separate heel pieces. The custom of making shoes right and left was common in classical times. The fashion of shoes and boots, as has occurred with other articles of dress, has undergone innumerable changes. In 1914, according to the last United States census of manufactures, there were in the boot and shoe industry 1,960 establishments, employing 227,605 persons. Their combined capital was $97,609,000 and the value of their products was $590,028,000. The principal centers of the industry were Lynn, Brockton, Haverhill, and Boston, all in Massachusetts, and St. Louis, Mo. See BOOTS AND SHOES.

SHOE-BILLED STORK, in ornithology, *Balæniceps rex*, a large stork found on

the upper Nile. It figures in many Arab myths. Called also the boot bill.

SHOEMAKER, HENRY WHARTON, an American newspaper publisher, born in New York, in 1882. He was educated at Columbia University, N. Y. In 1903 and 1904 he served as secretary of the American Legation, Lisbon, Portugal, and of the American Embassy, Berlin, Germany. From 1905 to 1911 he was a member of the New York banking house of Shoemaker, Bates & Co., and since then director of numerous business corporations. Beginning with 1905, he was at various times the owner and publisher of several daily newspapers, chiefly in towns of Pennsylvania, acquiring finally the Altoona, Pa., "Tribune" and "Gazette." He was a member of the Associated Press, and a member of many domestic and foreign scientific, benevolent, and patriotic societies. At various times he held commissions in the New York and Pennsylvania National Guard. During the World War he served as a captain of the Military Intelligence Division, General Staff, United States Army, and as a member of the Pennsylvania Commissions for National Defence and of Public Safety. He edited "Philosophy of Jake Haiden" (1911); "The Passenger Pigeon in Pennsylvania" (1919), and was the author of "Immaterial Verses" (1898); "Wild Life in Western Pennsylvania" (1903); "Pennsylvania Mountain Verses" (1907); "Pennsylvania Mountain Stories" (1907); "More Pennsylvania Mountain Stories" (1912); "Susquehanna Legends" (1913); "Stories of Great Pennsylvania Hunters" (1914); "Stories of Pennsylvania Animals" (1914); "Pennsylvania's Grandest Cavern" (1914); "Captain Logan" (1915); "Juniata Memories" (1916); "Eldorado Found" (1917); "Extinct Pennsylvania Animals" two parts (1917-1918); "North Pennsylvania Minstrelsy" (1919); etc.

SHOLAPUR, chief town of Sholapur district, Bombay presidency, India, 150 miles from Poona. Its situation between Poona and Hyderabad has made it, especially since the opening of the railway in 1859, the center for the trade of a large extent of country. Its chief industry is the manufacture of silk and cotton cloth. Sholapur was stormed by General Munro in 1818, when the whole of the Peshawa's territories were incorporated in the Bombay presidency. Pop. about 61,500.

SHONTS, THEODORE PERRY, an American capitalist and railway official, born in Crawford co., Pa., in 1856. While he was still a boy his parents removed to Iowa. He graduated from Monmouth College in 1876. For several years he worked as an accountant. In a short time he secured employment by National banks in Iowa, to standardize and simplify their methods of bookkeeping. He studied law and for a short time practiced, but soon became interested in railroad construction and management, and took part in the building of several important railways in the west. He also became a partial and controlling owner in several important roads. In 1905 he was appointed by President Roosevelt as chairman of the Isthmian Canal Commission. He formulated the plans of that work and continued in this capacity until February, 1907, when he was chosen president of the Interborough-Metropolitan Co., of New York, afterward the Interborough Consolidated Corporation. He was also president or an official in many other railroads and financial institutions. He died in 1919.

SHOOTER'S ISLAND, an island between Newark Bay and Staten Island; chiefly noted for its large shipbuilding plant.

SHOOTING STAR, a small celestial body suddenly becoming luminous and darting across the sky, its course being marked by a streak of silvery radiance, which is an optical illusion caused by the rapidity of its passage. See METEOR.

SHORE, JANE, the famous mistress of Edward IV.; born in London, was well brought up, and married at an early age to William Shore, traditionally a goldsmith. After her intrigue with the king began her husband abandoned her, but she lived till Edward's death in the greatest luxury, enjoying great power through his favor. Her beauty was more that of expression than of features. Her greatest charm was her bright and playful wit. After the king's death, King Richard III., out of a pretended zeal for virtue, plundered her house of more than 2,000 merks, and caused the Bishop of London to make her walk in open penance, taper in hand, dressed only in her kirtle. Jane Shore survived her penance more than 40 years, dying in 1527.

SHORE LARK, or SHORE PIPIT, in ornithology, the *Otocorys* (*Alauda*) *alpestris*, a native of the N. of Europe and Asia. The adult male is about seven inches long; in summer, lores, cheeks, gorget, and band on top of head, ending in erectile tufts, black; nape, mantle and upper tail coverts pinkish brown, white beneath. They nest in a depression in the ground and lay four or five eggs—French-white mottled with dull olive-green or yellowish-brown.

SHOREY, PAUL, an American educator; born in Davenport, Ia., Aug. 3, 1857; was graduated at Harvard University in 1878; admitted to the bar in Chicago in 1880; was Professor of Greek at Bryn Mawr College in 1885-1892. In the latter year he accepted a similar chair at the University of Chicago. His publications include "De Platonis Idearum Doctrina" (1884); "The Idea of Good in Plato's Republic" (1895); "The Odes and Epodes of Horace" (1898); "Unity of Plato's Thoughts" (1903); "The Assault on Humanism" (1918), and numerous contributions to periodicals.

SHORTER, CLEMENT KING, an English editor; became editor of the "Illustrated London News" in 1891; also had charge of the "Sketch," "Album," and "English Illustrated Magazine," and was generally regarded as one of the ablest and most acute editors in London. His published works comprise: "Fifty Years of Victorian Literature, 1837-1887" (1897); "Charlotte Brontë and Her Circle" (1896); "Victorian Literature: Sixty Years of Books and Bookmen" (1897); "Immortal Memories" (1907); "George Borrow and His Circle" (1913); etc.

SHORTHAND, an art by which writing is abbreviated, so as to keep pace with speaking. Its great and general utility has been recognized in every age, and numberless systems have been devised to facilitate its acquirement. It was practiced by the ancients for its secrecy as well as for its brevity, and a work is extant on the art, which is ascribed to Tiro, the freedman of Cicero. The first English treatise on stenography, in which marks represent words, was published in 1588 by Timothy Bright, M. D., under the title, "Characterie; an Art of Short, Swift, and Secret Writing by Character." In 1602 appeared "The Art of Stenography, or Short Writing by Spelling Characterie," by John Willis. Notwithstanding the intricacy of this system, in which "arbitraries" are extensively used, it became popular and found many imitators. It was succeeded by the systems of Edmond Willis (1618), Henry Dix (1641), and Jeremiah Rich (1659). In 1672 appeared "A Pen Plucked from an Eagle's Wing: or, The Most Swift, Compendious, and Speedy Method of Short Writing." The author was William Mason, the most famous shorthand writer of the 17th century. His alphabet was formed from Rich's by altering the signs of six letters, viz., *g, h, j, o, r, w.*

In 1767 was published the system of Dr. Byrom, four years after his death, which, however, had been completed as early as 1720. This was in many respects an admirable system—characterized by "simple strokes and no arbitrary characters." In 1785 Dr. Mavor published his "Universal Stenography," an ambitious improvement on Byrom. His alphabet consists of 18 letters, two of which are for vowels. The characters for the vowels are a dot (.) and a comma (,). The comma in different positions indicates *a, e, i;* the dot, *o, u, y.* In 1786 appeared the famous system of Taylor, which was almost universally used previous to the publication of "Phonography" by Mr. Pitman in 1837. Taylor has 22 marks or characters: of these, 16 represent the alphabet; the remaining 6 standing for *ch, sh, th, ious, etc., viz.*

In 1837 appeared Pitman's "Phonography"—the first really popular system. Melville Bell, following in the path marked out by Pitman, founded his system on the sounds of the language. The first sketch appeared in 1849; in 1852 the first complete edition, under the title "Steno-Phonography." An improved edition was published as "The Reporter's Manual" in 1857. Bell's letters are written in three sizes; full size, half size, and "tick" size. Pitman makes his letters of two lengths only, full size and half size (the half-sized letters expressing an additional *t* or *d.*

The principal point of difference in the two systems is, that Bell subordinates his alphabet to a theory of sounds which is strictly correct; and Pitman, while acknowledging the principle of a phonetic representation, consults the convenience of the writer in the selection of signs. For example, the broad distinction of voice and breath consonants was first marked by Pitman by the happy expedient of writing heavy strokes for the voice letters *b, d, j, g, v, th* (in *then*), *z, zh,* and light strokes for the breath letters *p, t, ch, k, f, th* (in *thin*), *s, sh.* Bell adopted the same principle.

Shorthand is now largely practiced in both England and the United States, and has extended its benefits to many classes besides that of the professional reporter. This is due chiefly to the excellences of Pitman's system and to his activity in disseminating its principles. The existence of two styles of phonography, one adapted for letter writing and the other for reporting—the second, however, being only an extension of the first, and not a new system in itself—has been the chief basis of the popularity of phonetic shorthand. Popular modifications of Pitman's system have been made in the United States by Graham, Burnz, Munson and others. Shorthand machines for rapid dictation are considerably used. In 1909 the National Shorthand Reporters' Association appointed a committee to standard-

ize variations and establish shorthand on a thoroughly scientific basis.

SHORTHORN, a breed of cattle characterized by short horns, rapidity of growth, aptitude to fatten, and good temper. It was produced by Charles and Robert Colling, at Ketton and Barmpton, near Darlington, England, by a process of in-and-in breeding between 1780 and 1818. The Collings were imitated by R. T. and J. Booth between 1814 and 1863; by Thomas Bates between 1818 and 1849. The process has been followed in the United States since 1817.

SHORTHOUSE, JOSEPH HENRY, an English novelist; born in Birmingham, England, Sept. 9, 1834. His best-known novel is "John Inglesant" (1881). His other works include: "The Little Schoolmaster, Mark" (1883-1884); "Sir Percival" (1886); "A Teacher of the Violin" (1888); "Blanche, Lady Falaise" (1891); "The Humorous in Literature"; etc. He died in 1903.

SHORT STORY, THE. The anecdotal short story, which passes from tongue to tongue, and has done so since the earliest times, is no more a literary form than the riddle or the joke, although like these it may pass into literature. The literary short story is of course a much later product, although it is to be found scattered through the ancient literature of the Orient, of Greece, and of Rome. Notable examples of early short stories of a more or less literary character are to be found in famous collections, such as in the so-called "Arabian Nights," "The Seven Sages," the "Gesta Romanorum," which, originating usually in the East, and in some obscurely distant period, worked their way through many languages and centuries and came into Europe in the Middle Ages.

So far as modern literature is concerned, the importance of the literary short story really begins with the later Middle Ages in western Europe. Here, in two literatures, it became a recognized form of literary art, and was widely translated and imitated elsewhere in Europe.

The French *fabliaux* were verse short stories, originating in about the 12th century, humorous, often indecent, told or sung by the minstrels as an offset to romances and love lyrics. They represent the unromantic and often the seamy side of medieval life. "La Bourse Pleine de Sens" of Jean le Galois d'Aubepierre is an example. Many fabliau plots are still familiar to us in modern humorous stories.

More important were the *novelle*, brief prose stories, usually but not always realistic in mood, concise and pointed in form. They were written from the late 13th century onward by men of the civilized trading communities of Florence, Venice, and elsewhere in Italy, and though their plots are often old, they are given a local time and place, and are impregnated with the customs, the ideals, and the interests of the earliest renaissance. The range of the *novella* was wider than that of the *fabliau*. The tragic, the romantic, as well as the humorous and the anecdotal, were admitted into its compact brevity; and the *novelle* of great writers like Boccaccio, and lesser men, like Bandello and Straparola, have become sources for some of our best known plays. "Othello" and "Romeo and Juliet" are examples.

Mention only may be made here of the *exempla*, brief, didactic narratives told usually of a saint and ending in a moral, written by monks and circulating in vast collections, usually in Latin, throughout the Middle Ages. The fable, a special form of the didactic short story, was still another popular variety and likewise drifted in great collections across Europe and into all the important vernaculars.

In English these various types of short stories had a sudden flowering in the works of one great author. Geoffrey Chaucer, at the end of the 14th century, took the *fabliau*, the *novella*, the *exemplum*, the fable (which came to him through the so-called beast epic of "Reynard the Fox"), and filling old plots with his own humor and shrewd observation made "The Canterbury Tales," which remain for the English-speaking reader the best summary of the earlier periods of the literary short story.

The short story of the period of the full renaissance, the 16th and 17th centuries, is relatively unimportant. It is in all the greater European literatures a kind of expanded *novella*, usually florid in phrasing, and adorned with a rather empty romance. In English, the stories of Greene and Lodge, which Shakespeare read, are favorable examples.

The latter 17th and the 18th century, periods of a new didacticism and a renewed respect for concision in writing, were better seeding grounds for the short story. Here belongs the simple and direct short narrative which usually reflects in its conclusion upon some aspect of life or human nature, though often no moral is attached. The French called this the *conte*, and it was written in such perfect examples in verse by La Fontaine (see his "Fables"), in prose by Voltaire, Marmontel, and Diderot, that the tradition has remained constant ever since in French literature. In England, the periodical essayists, Steele, Addison, Dr.

Johnson, developed a briefer, more highly moral form of short story, which was appended usually to their essays.

The modern short story, as we have it in English today, is a product of the Romantic movement at the end of the 18th and the beginning of the 19th centuries. In French, concision and unity have always been characteristic of the short story, and the change in form has been less great.

Books and magazines in the early nineteenth century are full of short narratives which deal with the horrible, the mysterious, the pitiful. Many of these were written by, or imitated from, the stories of the so-called German romantic school, J. L. Tieck, de la Motte Fouqué, A. Hoffman, etc. Occasionally these stories, as with Washington Irving's "Rip Van Winkle" (1819), or Sir Walter Scott's "Wandering Willie's Tale" (1824), are clear and beautiful in form, but usually they are rambling, turgid, and often pointless. The taste for didactic stories had disappeared. The growth of the magazine had created a real need for *short* stories that were effective. The problem was first worked out in America.

Edgar Allan Poe, already a poet of ability in the romantic manner, applied, in the attempt to write stories of horror and mystery that would grip the imagination, the principle of narrative suspense. In "Ligeia" (1838), "The Fall of the House of Usher" (1839), "The Mosque of the Red Death" (1842), he made a single vivid impression the result of the reading of his story; accomplishing this in part by a carefully toned style, but more particularly by consciously directing the interest of the reader from the very first sentence toward the climax of his story. The result was a kind of short story that in spite of its brevity *did* make an effect on the imagination. In other words, Poe achieved a higher unity for the short story.

The story of weird romanticism has gone out of fashion, but the method Poe used has remained a prime factor in writing short stories. In America Hawthorne, with his "Twice-Told Tales" (1837, 1842) was little influenced by it, because his moral tales were based upon situations which themselves gave unity to the story. But Bret Harte (see "The Outcasts of Poker Flat," 1869), T. B. Aldrich (see "Marjorie Daw," 1873), F. R. Stockton (see "The Lady or the Tiger," 1882); the writers of local color short stories, such as Sarah Orne Jewett (see "A Native of Winby," 1893), and Hamlin Garland (see "Main Traveled Roads," 1891); O. Henry (see "The Four Million," 1906), Edith Wharton (see "Crucial Instances," 1901, and "Ethan Frome," 1911), and the magazine writers of today, are all deeply indebted to Poe for this artificial but very effective method of giving high specific gravity to a short story. Henry James, however (see, for example, "The Madonna of the Future," 1873, or "The Real Thing," 1893), trusted to a single subtle situation as the factor of unity in his stories.

In England, the really important short-story writers have been less numerous. Rudyard Kipling (see for example, "Soldiers Three," 1888, and "They," 1904), learned his art from Bret Harte and Henry James, but chose his material from fresh fields. R. L. Stevenson (see "Markheim," 1885) is, in short narrative, Hawthorne's most evident disciple. In France, the tradition of the simple *conte* has been carried on by Prosper Mérimée (see "Mateo Falcone," 1829), Alphonse Daudet (see "Contes du Lundi," 1873), Guy de Maupassant (see "Contes du Jour et de la Nuit," 1885), Anatole France (see "Les Sept Femmes de la Barbe-Bleue," 1909), and many others.

In Russia with Ivan Turgenev (see "A Lear of the Steppes," 1870), Maxime Gorky (see "Chelkosh," 1895) and Anton Pavlovitch Chekhov (see "The Kiss and Other Stories," in English, 1908), a freer, less artificial form of short narrative, casual and impressionistic in effect, but highly unified in theme, has become familiar to western readers. Good in itself, it is valuable as a protest against the increasing artificiality of the American form. In a sense, the vivid verse narratives of Robert Frost, Edgar Lee Masters, Amy Lowell, and other realist American poets may also be regarded as American short stories written in a new and fresher fashion.

For a selective list of representative short stories from the earliest times to 1903, see Jessup & Canby, "The Book of the Short Story." A good bibliography is included in the "Cambridge History of American Literature." See also Brander Matthews' "The Philosophy of the Short Story," H. S. Canby, "The Short Story in English"; Walter B. Pitken, "The Art and Business of the Short Story."

SHORTT, EDWARD, a British public official. He was educated at Durham School and University and became a barrister. He was Recorder of Sunderland during 1907-18, and in 1910 became Liberal member of parliament for Newcastle. In 1918-1919 he was Chief Secretary for Ireland and became Home Secretary since 1919.

SHOSHONE FALLS, an attractive fall in the Lewis or Snake river, Idaho. They rank among the waterfalls of North America, next to those of Niagara in

grandeur, being about 250 yards wide and 200 feet high.

SHOSHONE INDIANS, a family of American Indians, also known as Snakes, living since 1805 to the W. of the Rocky mountains; they are now on four reservations, two in Idaho, one in Wyoming, and one in Nevada. Hostilities ceased in 1867, after an expedition had destroyed a great part of their braves and stores. Total number about 4,000.

SHOT. See AMMUNITION; PROJECTILE, etc.

SHOULDER JOINT, the articulation of the upper arm or humerus with the glenoid cavity of the scapula or shoulder blade (see ARMS). The shoulder joint forms an example of the ball-and-socket joints, the ball-like or rounded head of the humerus working in the shallow cup of the glenoid cavity. Such a form of joint necessarily allows of very considerable movement, while the joint itself is guarded against dislocation or displacement by the strong ligaments surrounding it, as well as by the tendons of its investing and other muscles. The muscles which are related to the shoulder joint are the supraspinatus above, the long head of the triceps below, the subscapularis internally, the infraspinatus and teres minor externally, and the long tendon of the biceps within. The deltoid muscle lies on the external aspect of the joint, and covers it on its outer side in front and behind as well, being the most important of the muscles connected with it. The movements of the shoulder joint consist in those of abduction, adduction, circumduction, and rotation—a "universal" movement being thus permitted; and its free motion is further aided, when the bony surfaces are in contact, by separate movements of the scapula itself, and by the motion of the articulations between the sternum and clavicle, and between the coracoid process and clavicle also. The biceps muscle, from its connection with both elbow and shoulder joints, bring the movements of both into harmonious relation.

SHOUSE, JOUETT, an American public official, born in Woodford co., Ky., in 1879. He was educated at the Mexico (Mo.) High School, and at the University of Missouri. From 1898 to 1904 he was successively reporter, managing editor, and business manager of the Lexington (Ky.) "Herald," and also editor and manager of "The Kentucky Farmer and Breeder." After being interested in various enterprises at Lexington, Ky., from 1904 to 1911, he removed in the latter year to Kansas and engaged there in farming and stock-raising. From 1913 to 1915 he served in the Kansas Senate, and from 1915 to 1919 he was a member of the 64th and 65th Congresses, from the 7th Kansas District. In 1919 he was appointed assistant secretary of the Treasury.

SHOVEL, SIR CLOUDESLEY, an English naval officer; born probably in Clay, a Norfolk fishing village, about 1650. He was apprenticed to a shoemaker, but he ran away to sea, and soon rose by his remarkable ability and courage through the grades of cabin boy and seaman to the quarter deck. He served as lieutenant under Sir John Narborough in the Mediterranean (1674), burned four pirate ships under the walls of Tripoli, commanded a ship at the battle in Bantry Bay (1689), and was soon after knighted for his conduct. In 1690 he rose to be rear-admiral of the blue, and took an active part in the battle off Beachy Head; two years later, as rear-admiral of the red, he supported Admiral Russell heroically at La Hogue, and himself burned 20 of the enemy's ships. He was sent to Vigo in 1702 to bring home the spoils of Rooke, next served under him in the Mediterranean, and led his van at Malaga. In January, 1705, he was made rear-admiral of England. That year he took part with Peterborough in the capture of Barcelona, but failed in his attack on Toulon in 1707. On the voyage home his ship, the "Association," struck a rock off the Scilly Isles on the foggy night of Oct. 22, 1707, and went down with 800 men on board. Four vessels of his squadron perished with as many as 2,000. Sir Cloudesley Shovel's body was washed up next day and buried in Westminster Abbey.

SHOVELER, in ornithology, the *Spatula* (*Ana*) *clypeata*, the broadbill or spoonbill duck, widely distributed over the Northern Hemisphere. Length about 20 inches; bill much widened on each side near tip, somewhat resembling that of the spoonbill; head and upper part of neck in adult male rich green, lower part white, back brown, breast and abdomen chestnut brown. It nests in some dry spot near water, and lays from 8 to 14 greenish-buff eggs. Also the white spoonbill.

SHOW BREAD, or SHEW BREAD, in Judaism, a word modeled on the German *schaubrode*, Luther's rendering of the Hebrew *lehem hapanim*=bread of the faces or face, perhaps meaning designed for the presence of Jehovah. It is called also the "continual shew bread" (II Chron. ii. 4), or, more briefly, the "continual bread" (Num. iv. 7), or "hallowed bread" (I Sam. xxi. 4-6). It was to be set on a table of shittim wood, overlaid

with gold (Exod. xxv. 23-29; I Kings vii. 48), and having a blue covering (Num. iv. 7). The shew bread consisted of 12 cakes baked with fine flour, two-tenth deals being in each cake (Lev. xxiv. 5). It was to stand in the Holy Place, and, being sprinkled with frankincense, was there to be eaten each Sabbath by Aaron and his priestly descendants (Lev. xxiv. 9). When the old shew bread was removed, new and hot bread was to take its place (I Sam. xxi. 6). When David was in want of food, he ate the shew bread, though he was not a priest (I Sam. xxi. 3-6), and Jesus approved the deed (Matt. xii. 4; Mark ii. 26; Luke vi. 4). The 12 cakes of shew bread were apparently one for each tribe; the deeper spiritual significance of the bread has been variously interpreted.

SHOWERMAN, GRANT, an American university professor, born at Brookfield, Wis., in 1870. He was educated at the University of Wisconsin, from which he received the degrees of A.B., A.M., and Ph.D. From 1898 to 1900 he was a fellow at the Archæological Institute of America at the American School of Classical Studies, Rome, and in 1900 became professor of classics at the University of Wisconsin. He was a member of various educational and other societies. Besides contributing to the leading literary magazines and philological journals, he wrote "With the Professor" (1910); "Translation of Ovid's Heroides and Amores" (Loeb Classical Library, 1914); "The Indian Stream Republic and Luther Parker" (1915); "A Country Chronicle" (1916); and "A Country Child" (1917).

SHRADY, HENRY MERWIN, an American sculptor, born in New York City, in 1871. He was educated at Columbia University and studied law, which, however, he never practiced, being engaged in business from 1895 to 1900. From then on he devoted himself to sculpture. Although being entirely self-taught, he won the competition for the equestrian statue of General George Washington in Brooklyn, N. Y., in 1901, and another competition for the Grant Memorial in Washington, D. C., in 1902. He also executed various other statues, chiefly equestrian, for Detroit, Charlottesville, Va., and Duluth. In 1909 he became an Associate of the National Academy, and he was also a member of the National Institute of Arts and Letters, the Architectural League, and the National Sculpture Society.

SHRAPNEL, HENRY, an English inventor, entered the Royal Artillery in 1779, served with the Duke of York's army in Flanders, and shortly after the siege of Dunkirk invented the case shot known by the name of shrapnel shells, an invention for which he received from government a pension of $6,000 a year in addition to his pay in the army. He retired from active service in 1825, attained the rank of Lieutenant-General in 1837, and died in 1842.

SHRAPNEL. See PROJECTILE; SHELL: EXPLOSIVES.

SHREVEPORT, a city and parish-seat of Caddo parish, La.; on the Red river, and on the Texas and Pacific, the Houston and Shreveport, the St. Louis Southwestern, and other railroads; 326 miles N. W. of New Orleans. It is one of the most important cities in Louisiana, owing to its location in a great stockraising and cotton growing region. Here are St. John's College, St. Vincent's Convent, St. Mary's Convent, hospitals, sanitoriums, a high school, United States government building, United States Marine Hospital, board of trade, cotton exchange, waterworks, street railroad and electric light plants, National and State banks, and several daily and weekly newspapers. Shreveport has a large trade in wool, cotton, livestock, groceries, and hides; cotton gins, cotton-seed oil mills, cotton compresses, manufactories of ice, cotton machinery, etc. Pop. (1910) 28,015; (1920) 43,874.

SHREW, in zoölogy, a popular name for any individual of the *Soricidæ*, particularly the common (*Sorex vulgaris*) and the lesser shrew (*S. pygmæus*). The former is about the size of a mouse, which it somewhat resembles, but has the muzzle produced, with prominent nostrils, far beyond the lip; the eyes are scarcely discernible through the fur; ears wide and short; the tail is four-sided, with the angles rounded off; fur usually reddish-gray above, grayish beneath, but the color varies. They feed on insects and worms and the smaller mollusca; they are extremely pugnacious, and two males scarcely ever meet without a battle, when the weaker is killed and eaten. They breed in the spring; the female makes a nest of dry herbage in a hole in the ground, and brings forth from five to seven young, but their increase is checked by the weasel and barn owl.

SHREW MOLE (*Scalops aquaticus*), a genus of insectivorous mammals, belonging to the family of *Soricidæ* or shrew mice, but also by some zoölogists placed in the *Talpidæ* or mole family. It is found in North America, usually near rivers and streams, and burrows after the fashion of the common mole.

SHREWSBURY, a municipal and parliamentary borough of England, capital of Shropshire, situated on a slightly elevated peninsula formed by a bend of the Severn, 42 miles N. W. of Birmingham. It consists of some handsome modern houses and many old timbered houses of very picturesque appearance. Several bridges cross the Severn and connect the town with its suburbs. Among objects deserving of notice are the remains of the old walls; the ruins of the castle; the Church of Holy Cross, originally attached to a magnificent Benedictine abbey, founded in 1083; the grammar school, ranking high among public schools, founded by Edward VI. in 1551, and removed to new buildings at Kingsland in 1882; the market house, of the time of Queen Elizabeth; statues of Lords Clive and Hill, etc. The chief manufactures are glass staining, the spinning of flax and linen yarn, iron founding, brewing, the preparation of brawn, and the making of the well-known "Shrewsbury cakes." In 1403 the famous battle which ended in the defeat of Hotspur and the Earl of Douglas, his ally, by Henry IV. was fought in the vicinity. Pop. about 30,000.

SHRIKE, in ornithology, a popular name for any individual of the *Laniidæ*, applied specially for the last three centuries to *Lanius excubitor*, the great gray shrike. The length of the adult male is about 10 inches; pearl gray on upper part of body; chin, breast, and abdomen white; tail feathers black, variegated, and tipped with white; a black band crosses the forehead. The lesser gray shrike (*L. minor*), from eight to nine inches, is an occasional winter visitor. The red-backed shrike (*L. collurio*), like *L. septentrionalis*, is often called the nine killer, and with one or two other small shrikes is sometimes placed in a genus *Enneoctonus*. Shrikes feed on insects and small birds, and have a remarkable habit of impaling their prey on thorns in the neighborhood of their nests, which may thus be easily discovered. They kill and impale many insects that they do not eat. See BUTCHER BIRD.

BULL-HEADED SHRIKE

SHRIMP, a popular name for any individual of the genus *Crangon*, allied to lobster, crayfish, and prawn. The form is elongated, tapering, and arched. The rostrum is very short, claws small, the fixed finger being merely a small tooth, the movable finger unciform. The whole structure is delicate and subtranslucent. When alarmed they bury themselves in the sand by a peculiar motion of the telson. The common shrimp (*C. vulgaris*), about two inches long, greenish-gray dotted with brown, is esteemed as an article of food. They are usually taken by a net. Also, the *Pandalus annulicornis*, taken in the northern waters of Europe. When alive its color is reddish-gray, with red spots. When boiled it becomes a deep red.

SHRINE, a case, box, or reliquary in which the bones or other remains of saints were deposited. They were often richly ornamented with gold, precious stones, and elaborate carvings, and were generally placed near the altar of the church.

SHROPSHIRE, or **SALOP**, a county of western England, adjoining Wales. Area, 1,346 square miles. Pop. about 250,000. The principal river is the Severn, flowing in a southeasterly direction across the county for a distance of some 70 miles. It is navigable throughout its entire course. In the N. and N. E., the generally level country is worked extensively for agricultural purposes. In the S. and S. W., where the county is hilly, rising at times to an altitude of 1,800 feet, cattle breeding is the principal industry. A peculiarly horned sheep is well known as the product of the county. The county also has extensive mineral deposits, consisting of coal, iron, copper, and lead, which are worked successfully and form the basis of important iron industries. Capital, Shrewsbury.

SHROVE TUESDAY. See MARDI GRAS.

SHRUB, in botany, a plant with woody stem and branches like a tree, but of smaller size, not generally exceeding 20 feet in height, and branching near the root, so as to have no main stem of considerable height. When a shrub is of small size and much branched, it is often called a bush. Also a liquor composed of acid, particularly lemon juice and sugar, with spirit to preserve it.

SHUFELDT, ROBERT WILSON, an American author, born in New York in 1850. He was educated at Cornell University, and in 1876 received the degree of M.D. from Columbian (now George Washington) University. During the Civil War he served as a midshipman. In 1876 he was commissioned 1st lieutenant, medical department, United States Army, retiring in 1891 with the rank of major. From 1876 to 1881 he served as surgeon during the Indian wars. In 1882 he became curator of the Army Medical Museum, Washington. He was a member of many domestic and foreign scientific societies. His numerous publications include, besides some 1,300 articles on medicine, science, travel, etc., "Scientific Taxidermy for Museums" (1894); "The Negro" (1907); "Osteology of Birds" (1909), etc.

SHUMAGIN ISLANDS, a group of islands lying S. W. of Kodiak, Alaska. The largest is Unga, on which is a Federal judicial station. Fox farming is carried on in several of the islands. The headquarters of the Alaskan cod fishing is in Unga.

SHUMLA, or **SHUMA**, a fortified town of Bulgaria; on the Little Balkan, to the N. of the main range, at an elevation of 800 feet; 50 miles W. of Varna; and 60 S. E. of Rustchuk. It is of great strategical importance, commanding as it does the roads from the fortresses in the Lower Danube and in the Dobrudscha, and those from the E. passes of the Balkans. It is closed in on the N. and W. by mountains, and looks out to the E. and S. on an open plain where grain and the vine are cultivated and where there is extensive silk culture. Surrounded by high massive walls, it is further defended by a citadel on the heights, and by several forts. The town has many mosques, large barracks for cavalry and artillery as well as infantry, an arsenal, military hospital, etc. There are manufactures of copper and tin wares, silk, leather, and wearing apparel. A great fair is held in June. The Russians failed to take the town in 774, 1810, and 1828. No attempt on it was made in the war of 1877-1878, but the place was evacuated by the Turks on the conclusion of peace. Pop. about 22,000.

SHURTLEFF COLLEGE, a coëducational institution in Upper Alton, Ill.; founded in 1835 under the auspices of the Baptist Church; reported at the close of 1919: Professors and instructors, 15; students, 198; president, G. M. Potter, A.M.

SHUSTER, W(ILLIAM) MORGAN, an American lawyer and editor, born in Washington, D. C., in 1877. He graduated from the Central High School in 1893, and studied law at Columbian University and Law School. He served in various government departments, and was insular collector of customs at Manila from 1901 to 1906. From 1906 to 1909 he was a member of the Philippine Commission, and secretary of public instruction in the Philippines. From May, 1911, to January, 1912, he served as treasurer-general and financial adviser of Persia. His administration of the finances of this country were widely praised, but he was obliged to resign on account of the intrigues of Russia. Returning to the United States, he engaged in business, and in 1915 became president of the Century Co., and editor of the "Century Magazine."

SHUTE, HENRY AUGUSTUS, an American author, born in Exeter, N. H., in 1856. He was educated at Harvard University, and in 1882 was admitted to the bar. In 1883 he became judge of the police court of his native town. He wrote "Real Diary of a Real Boy" and "Sequel" (1904); "Letters to Beany and Love Letters of Plupy Shute" (1905); "Real Boys" (1905); "A Few Neighbors" (1906); "A Profane and Somewhat Unreliable History of Exeter" (1907); "The Country Band" (1908); "Farming It" (1909); "A Country Lawyer" (1911); "Plupy" (1912); "Misadventures of Three Good Boys" (1914); "The Youth Plupy" (1917); "The Lad with the Downy Chin" (1917).

SHUTTLE, SCHYTTYL, or **SHYTTELL**, in weaving, an instrument used by weavers for shooting or passing the thread of the weft from one side of the web to the other, between the threads of the warp. It is a boat-shaped piece of wood, which carries a bobbin or cop containing the yarn of the weft or woof. The shuttle sometimes has wheels to facilitate its motion. It is thrown by hand or by the fly. The fly shuttle was invented by John Kay, of Bury, England, in 1733.

In a sewing machine, the sliding thread-holder which carries the lower thread between the needle and the upper thread, to

make a lock stitch. In hydraulic engineering, the gate which opens to allow the water to flow onto a wheel. That side of a wheel which receives the water is known as the shuttle side.

SIAGONIUM, in entomology, the typical genus of *Siagoninæ*. They have porrected horns on the head and thorax. The males are in two sets, differing greatly in the size of their bodies and in the development of their horns. The females are the more numerous sex.

SIAM, a kingdom embracing a great part of the Indo-Chinese Peninsula and part of the Malay Peninsula, and lying between Burma on the W., and Annam and Cambodia on the E. and S. E. Its boundaries are ill defined on the N. and N. E., but its area is estimated at about 195,000 square miles, and its population (1919) at 8,924,000. Capital, Bangkok. Pop. 630,000.

Topography.—A large part of the territory is not well known. Siam proper consists mainly of the low-lying alluvial basin of the Menam and its numerous tributaries, which flows S. into the Gulf of Siam, forming an extensive and intricate delta. This alluvial plain, intersected by numerous streams and canals, is extremely fertile, producing crops of rice, sugar, cotton, maize, and indigo. Both sides of the Manam basin are skirted by densely wooded ranges of hills, forming the water partings toward the Salwin and Mekong, the latter of which is the great river of eastern Siam. The minerals include gold, tin, iron, copper, lead, zinc, and antimony, besides several precious stones, such as the sapphire, Oriental ruby, and Oriental topaz. Mining is chiefly in the hands of the Chinese. Much of Upper Siam seems incapable of being cultivated. During the dry season, which lasts from November to May, there is an utter absence of rain in this region, which again is so flooded by rain during the wet season as to be converted into a vast swampy forest. Cocoa and areca palms are numerous in Siam; fruits are abundant and of excellent quality; black pepper, tobacco, cardamoms, and gamboge are important products. The forests produce aloes wood, sappan wood, teak timber, bamboos, rattans, gutta percha, dammar, catechu, benzoin, etc. Among wild animals are the tiger, leopard, bear, otter, ourang-outang, single-horned rhinoceros, and elephant, which here attains a size and beauty elsewhere unknown. The last, when of a white color, is held in the highest reverence. The forests abound with peacocks, pheasants, and pigeons; and in the islands are large flocks of the swallows that produce the famed edible birds' nests. Crocodiles, geckoes, and other kinds of lizards, tortoises, and green turtles are numerous. The python serpent attains an immense size, and there are many species of snakes.

Commerce and Finances.—Practically the entire trade of the country is in the hands of foreigners and in recent years many Chinese have settled in the country and have become important in commercial activities. The total imports in 1918 and 1919 amounted to £7,930,147, and the exports £12,469,956. The principal imports are cotton goods, foodstuffs, raw material, metal manufactures and machinery, mineral oils, silk goods, and tobacco. The chief exports are rice and teak. The total revenue in 1919-20 amounted to £5,853,-846 and the expenditure to £5,850,526. The total national debt in March 31, 1920, was £6,630,960. A British officer holds the position of financial adviser, and other British officers hold advisory positions in the government, especially in the departments of finance, revenue, forests, and police.

Army and Navy.—Military service is compulsory and the army is organized along European lines. The peace strength is over 20,000 men. The navy consists nominally of 21 vessels, but they are of little effective value.

Government.—The executive power is in the hands of the king who is advised by a cabinet consisting of the heads of the various departments of the government. There is also a legislative council composed of not less than 12 members, appointed by the Crown. The total membership in 1920 was 40. The kingdom is divided into 18 provinces, of which 17 have each a lord lieutenant, taking their authority directly from the king, who in 1920 was Chao F'a Maha Vajiravudh, who succeeded his father in 1910. His official title is King Rama VI.

People.—The Siamese are members of the great Mongolian family, and of the same race as the people of Burma and Annam. In stature they do not average more than 5 feet 3 inches in height; they have a lighter colored skin than the Western Asiatics, but darker than the Chinese. Elementary education is general, most of the Siamese being able to read and write. The houses are mostly constructed of timber and bamboo, and in localities subject to inundation are raised on piles. The Siamese profess Buddhism, introduced into the country about the middle of the 7th century. Christianity is now making some progress in the country. Some of the temples are large and elaborate structures richly decorated. The language forms a connecting link between the Chinese and Malay. The written characters seem to be derived from a form of Sanskrit. The literature is

meager, uninteresting, and in point of imagination and force of expression much below the Arabic, Persian, or Hindustani. The language of the chief Buddhist works is Pali. The printing press has been introduced in recent years, and many of the best Siamese works can now be had in a printed form.

History.—Siam appears to have no place in history prior to A. D. 638, and the credible records go back only to 1350, the date of the foundation of Ayuthia, the old capital. The Portuguese established intercourse with Siam in 1511, but in the 17th century were gradually supplanted by the Dutch. English traders were in Siam very early in the 17th century, but in consequence of a massacre their factory at Ayuthia was abandoned in 1688. The French were expelled about the same time, and the trade was neglected till 1856, when Sir J. Bowring's treaty again opened up Siam to Europeans.

The French, desiring access to China by means of the river system of the peninsula, accused Siam of encroaching on the territory of Annam, and in 1893 sent a fleet to Bangkok, where peace was dictated. Cambodia and the territory E. of the Mekong river were placed under French protection. A belt extending for a distance of 25 kilometers W. of Mekong was neutralized and valuable trade privileges were conceded to France. From that time the French sphere of influence gradually extended still further west and by a treaty made in 1904 France obtained control of about 8,000 square miles to the W. of the Mekong and the S., as well as other territory. By a treaty between France and Great Britain made in the same year, the territories to the W. of the Menam and the Gulf of Siam were recognized as in the British sphere of influence, while those to the E. were in the French. France and Great Britain guaranteed the future integrity of Siamese territory. In 1907, however, more territory was ceded to France and in 1909 three states were ceded to Great Britain. A conspiracy against the king was discovered in 1912, which was put down with great severity.

Siam remained neutral in the World War until July 22, 1917, when war was declared against the Central Powers. At the invitation of the Allied governments a force of volunteers were sent to France in 1918. These comprised chiefly aviation troops.

In recent years Siam has developed greatly commercially and economically. The government has been well administered and there has been notable improvement in the condition of the people.

SIANG-TAN, a prefectural city of China. It is in Hu-nan, on the Siang river, and though small, has large suburbs which extend for four miles along the bank of the river. It is the trade center of Hu-nan, and the river route between Peking and Canton is open to foreign vessels. Pop. about 300,000.

SIANG-YANG-FU, a Departmental city of China. It is situated in the province of Hu-peh, at the junction of the Pai and Han rivers, and is opposite Fanching, which has silk and other industries. Both towns figured in the resistance to the campaign of Kublai Khan in 1268-73. Pop. about 50,000.

SIBELIUS, JEAN JULIUS CHRISTIAN, a Finnish composer, born at Tavastehus, Finland, in 1865. He was educated at Helsingfors and studied music at Berlin and Vienna, becoming a member of the Musical Academy of Stockholm. He was a chevalier of the Legion of Honor and Accademico onorario di Santa Cecilia, Roma, and received other honors. His compositions include: music to the tragedy "Kaolema" (containing the "Valse Triste"); music to the tragedy of "King Christian II.," and the following orchestra pieces: "Carelia," "Dance Intermezzo," "Der Schwan von Tuonela," "Eine Sage," etc.

SIBERIA, a great division of the Russian dominions; occupies all North Asia, stretching uninterruptedly E. from the Ural mountains to the Pacific Ocean, and S. from the Arctic Ocean to the Chinese dominions and Russian Central Asia; total area, 4,831,882 square miles; pop. about 10,378,000. It is divided into the governor-generalships of western Siberia, eastern Siberia, and the Amur region. A region of such vast extent has naturally a very diversified configuration; but generally speaking Siberia may be considered as a vast inclined plane sloping gradually from the Altai, Syan, and Yablonoi mountains on the S. to the Arctic Ocean on the N. In the E. it is traversed in different directions by several mountain ranges, but elsewhere it is almost unbroken by any greater heights than a few hills. It is drained chiefly by the Obi (2,120 miles), with its great tributary, the Irtish (2,520 miles), the Yenisei, and the Lena (3,000 miles), all of which pursue a N. course to the Arctic Ocean; and by the Amur (2,700 miles, 2,400 of which are navigable), which flows in an E. and N. E. direction to the Pacific. The principal lake is Lake Baikal in the S., 400 miles long, 20 to 53 broad, and 1,560 feet above sea-level. The chief islands are the New Siberia group in the Arctic Ocean, and the island of Sakhalin, off the mouth of the Amur, in the Sea of Okhotsk, an arm of the Pacific. The coast line is very

extensive, but the Arctic Ocean is ice-bound at least 10 months out of the 12, and is almost valueless for commercial purposes, and the Sea of Okhotsk, on the Pacific, is infested with masses of floating ice and dense fogs. The principal ports are Vladivostock, on the Sea of Japan, the chief naval station of Russia on the Pacific; Okhotsk, on the Sea of Okhotsk; and Petropavlovsk, on the E. coast of Kamchatka.

Siberia has a warm summer, but the winter is exceedingly severe. South Siberia has, in many parts, a very fertile soil, which yields rich crops of wheat, rye, oats, and potatoes; but immense tracts of Siberia are utterly unfit for tillage, more particularly the tundras, or great stretches of boggy country along the Arctic Ocean. In the W. are extensive steppes. Roughly speaking, the N. limits of agriculture are 60° N. latitude. Cattle breeding and bee keeping are largely pursued. Hunting and fishing are also sources of remuneration, ermines, sables, and other fur-bearing animals being numerous. The wild animals include the elk, reindeer, and other deer, bear, wolf, white and blue fox, lynx, etc. The forests are extensive and valuable. Even before the World War manufactures and mining were in a backward state, though Siberia has very considerable mineral wealth. Large quantities of gold are obtained, as well as silver, platinum, lead, iron, coal, etc. The trade was mainly with Russia, which took every year from Siberia about $20,000,000 worth of raw products, chiefly tallow, hides, furs, and grain; and sent every year to Siberia about $60,000,000 worth of manufactured wares. The foreign trade was insignificant. The chief towns are Irkutsk, capital of eastern Siberia, a trading city; Tomsk, capital of Tomsk province, a trading city, with a university; and Tobolsk, capital of western Siberia. Yermak the Cossack entered western Siberia in 1580, and made a rapid conquest of the W. portion of the country, which he handed over to Ivan the Terrible of Russia. Bands of hunters and adventurers then poured across the Urals, attracted by the furs, and gradually penetrated to the Arctic Ocean and the Pacific. The latest acquisitions by Russia were the Amur territory and coast regions of Manchuria, ceded by China in 1858 and 1860. Exile to Siberia began soon after the conquest, and until the downfall of the Imperial Government in 1917, Siberia was a great penal colony. Hardened convicts and important political offenders were kept under close control, but the great majority of the exiles were simply placed in a particular district and allowed to shift for themselves. Valuable goldfields have been discovered in Yeniseisk, and in the basins of the Obi, Lena and Amur rivers. In recent years thousands of Russian peasants have emigrated hither, and nearly all the fertile soil free of forest land outside the steppes has been occupied. A new sea route through the Kara Sea to Siberia has been opened up lately. The railway connection between Russia and Siberia forms the greatest railway scheme in the world. See RUSSIA: TRANS-SIBERIAN RAILWAY.

During, and especially after, the World War, radical political changes took place in Siberia, as in Russia proper. After the fall of the Imperial Government, in March, 1917, and after the fall of the Provisional Government in the following November, and the rise into power of the Bolshevik Government, political chaos spread over the country, until gradually a provisional government was established by General Alexander Kolchak, with headquarters in Omsk. In January, 1920, the Kolchak Government went down before the assaults of the Red Bolshevist armies, made possible by the internal discontent of the population.

During the year ending with January, 1921, still further changes took place. Transbaikalia was divided into two separate districts; the Chita District, where the Cossack leader, Seminov, had established a military dictatorship under the protection of the Japanese army of invasion; and the Verkhne-Undinsk District, where a form of government similar to that of the Bolsheviki was established. The Amur Province remained unchanged, and Blagovieschensk became the headquarters of the revolutionary government of the Eastern Siberian Republic, recognized by the Bolsheviki as a concession to Japan, which desired a buffer state between its territory and Soviet Russia. The Maritime Province, which now includes Kamchatka and the northern part of Sakhalin, is administered from Vladivostok by a government which, while strongly inclined toward Socialism, was under the influence of the Japanese army of occupation. In October, 1920, the Red Army, in co-operation with local revolutionary forces, succeeded in driving Seminov out of the Chita District, the Cossack chief himself seeking flight across the Chinese frontier.

SIBERIAN DOG, a variety of the Eskimo dog, but of larger size and more docile temper. They do not stand so high as the pointer, but their thick hair, three or four inches long in the winter, gives them an appearance of greater stoutness. Under this hair is a coating of soft, fine wool, which begins to grow in the winter and drops off in the spring. Muzzle sharp, generally black; ears erect.

SIBERIAN RAILWAY. See TRANS-SIBERIAN RAILWAY.

SIBERT, WILLIAM LUTHER, an American soldier, born at Gadsden, Ala., in 1860. He graduated from the United States Military Academy in 1884 and was appointed 2nd lieutenant of engineers in the same year. In 1887 he graduated from the Engineering School of Application. He was appointed captain in 1896, major in 1904, and lieutenant-colonel in 1909. From 1887 to 1892 he was engaged in engineering river work in Kentucky, and from 1892 to 1894 he was engaged in the construction of a ship channel connecting with the Great Lakes. He was later engaged in engineering work in Arkansas and in the Philippines. From 1900 to 1907 he was in charge of the engineering of the river and harbor districts, with headquarters at Louisville and Pittsburgh. In March of the latter year, he was appointed a member of the Isthmian Canal Commission, and as engineer of the commission he built the Gatun Locks and Dam, the west breakwater, and excavated the channel from Gatun to the Atlantic Ocean. After completion of the Panama Canal, he served in China under the auspices of the American National Red Cross and the Chinese Government, on the board of engineers for flood prevention. He was made brigadier-general in 1915, and was extended the thanks of Congress for his work on the Panama Canal. In 1917 he was promoted to be major-general and was appointed commander of the 1st Division of the American troops in France, under General Pershing. He organized and was the director of the Chemical Warfare Service of the United States Army. He received a Distinguished Service Medal and was made a commander of the Legion of Honor by the French Government.

SIBYL, the name by which certain prophetic women were designated in ancient times. Their number is variously stated. Ælian mentions four—the Erythræan, the Samian, the Egyptian, and the Sardian; but it was popularly believed that there were 10 in all. Of these the most famous is the Cumæan, known by the names of Herophile, Demo, Phemonoë, Deiphobe, and Amalthæa. She was consulted by Æneas before his descent into the lower world, and accompanied him in his journey through the land of shadows. It was she who appeared before King Tarquin, offering him nine books for sale. The king refused to buy them, whereupon she went away, burnt three, and then returned, asking the original price for the remaining six. On his still refusing to purchase them, she again left, destroyed another three, and on her return offered to let him have the remaining three at the price which she had asked for the nine. Tarquin, astonished at such singular conduct, bought the books; and the sibyl vanished. On inspection they were found to contain directions as to the worship of the gods and the policy of the Romans. They were kept with great care in a stone chest in an underground chamber of the temple of Jupiter Capitolinus, at first by two commissioners, afterward by a college of 10, finally increased by Sulla to 15. These oracle keepers alone consulted them, by special order of the senate, in case of prodigies, dangers, and calamities.

In 83 B. C. the temple of Jupiter was burned and the original Sibylline books were destroyed. Ambassadors were accordingly sent to the different towns of Italy, Greece, and Asia Minor, to make a fresh collection. This was deposited in the temple when rebuilt. Spurious Sibylline books now began to accumulate and circulate in Rome. Augustus, fearing danger to the state from the abuse of them, ordered that all such should be delivered up. Over 2,000 were thus destroyed. Those that were accounted genuine were deposited in the temple of Apollo on the Palatine. The writing of these having become faded, Augustus commanded them to be rewritten. In the conflagration of Rome in the reign of Nero they were all again destroyed. New collections were made, which were publicly and finally burnt by the Christian Emperor Honorius.

The Sybilline oracles to which the Christian Fathers refer are in no sense whatever to be confounded with the older pagan collections. They are "pious frauds," belonging to early ecclesiastical literature. An exhaustive collection of the Sibylline oracles was published by Gallæus (1689). Fragments have been edited by Angelo Mai (1817) and Struve (1818).

SICILIAN VESPERS. Charles of Anjou, brother of Louis IX., King of France, having seized Sicily by virtue of a grant from Pope Alexander IV., the natives rose against the French the day after Easter, March 30, 1282. The massacre which ensued commenced at Palermo, extended to Messina and other parts of the island, and is known in history as the Sicilian Vespers.

SICILIES, THE TWO, a former kingdom of Italy, consisting of Naples (or S. Italy) and Sicily. In 1047, while Greeks and Saracens were struggling for the possession of lower Italy and Sicily, the 12 sons of Tancred de Hauteville, a count in lower Normandy, came in with their followers. Robert Guiscard, one of these brothers, subdued Apulia and Calabria, taking the title of duke, and his youngest

brother, Count Roger, conquered Sicily. Roger's son and successor, Roger II., completed the conquest of all Lower Italy by subduing Capua, Amalfi and Naples, at that time celebrated commercial republics, and in 1130 took the title of king, calling his kingdom the Kingdom of the Two Sicilies. In 1189 the race of Tancred became extinct, and the German emperor, Henry VI., of the house of Hohenstaufen, claimed the kingdom in right of his wife, Constantia, the daughter of Roger II. The kingdom remained with the family of Hohenstaufen till 1266, when Pope Alexander IV., feudal overlord, bestowed it on Charles of Anjou, brother of Louis IX. of France, who caused the legitimate heir, Conradin of Suabia (1268), to be beheaded. Sicily, however, freed herself in 1282 from the oppressions of the French by the aid of King Pedro of Aragon, and Naples was now separated from it, Sicily being under the Kings of Aragon, while Naples was under the Angevin dynasty. This dynasty was dispossessed in 1442 by Alfonso V. of Aragon, who bestowed Naples on his natural son Ferdinand.

In 1504 Sicily was again united to Naples under the Spanish crown, and governed by viceroys till 1713, when the peace of Utrecht again divided the Two Sicilies, Naples falling to Archduke Charles of Austria, Sicily to Duke Victor Amadeus of Savoy. King Philip V. of Spain reconquered Sicily in 1718, at the instigation of Alberoni, but was forced to cede it to Austria in 1720, Savoy receiving Sardinia in exchange, by which means the Two Sicilies became a part of the Austrian dominions. In 1734 the Spanish Infante Don Carlos, son of Philip V., at the head of an army invaded Naples, conquered both the continental and the insular part of the Kingdom, and was crowned at Palermo in 1735 as Charles III. This change was sanctioned by the treaty of Vienna (1783), and till 1860 this line of the Bourbon family maintained possession of the Two Sicilies, except for a few years during the Napoleonic period, when Joseph Bonaparte and Joachim Murat reigned on the mainland as kings of Naples. In 1759, when Charles ascended the Spanish throne under the name of Charles III., he conferred the Kingdom of the Two Sicilies on his third son Ferdinand, and decreed at the same time that it should never again be united to the Spanish monarchy. The reign of Ferdinand extended through the stormy period of the French Revolution and the subsequent European commotions. His successors, Francis I., Ferdinand II. (Bomba), and Francis II. were despotic tyrants who forced the people into periodic revolt, put down with much severity. In 1860, however, an insurrection broke out in Sicily, and an expedition of volunteers from Piedmont and other Italian provinces under Garibaldi sailed from Genoa to the assistance of the insurgents. The result was that the Neapolitan troops were driven from the island. Garibaldi, following up his success, crossed over to the mainland, where he met little or no opposition; Francis II. fled from Naples; the strong places in his hands were reduced; and by a popular vote the Kingdom of the Two Sicilies ceased to exist as such, and became an integral part of the Kingdom of Italy. See ITALY.

SICILY, an island belonging to the kingdom of Italy, in the Mediterranean, the largest and the finest in that sea, lying at the S. W. extremity of Italy, from which it is parted by the narrow Strait of Messina. Area, 9,936 square miles; pop. about 3,793,500. Sicily is of an irregularly triangular shape (hence its ancient Latin name of Trinacria), and is 180 miles in length by 120 in breadth. A mountain chain, seemingly a continuation of the Apennines, traverses the island E. and W., throwing off spurs, from one of which in the E. rises Mount Etna, the loftiest volcano in Europe, having a culmination of 10,900 feet; neither the lakes nor the rivers are of any considerable size or length. The plains and valleys which compose the greater portion of the island are remarkably fertile, and yield large crops of maize, wheat, rice, pulse, all kinds of vegetables, and abundance of fruits; the silk worm is largely cultivated. The minerals are marble, iron, copper, stone, agate, jasper, salt, and coal, while of sulphur the yield is enormous—about 300 mines. The manufactures, generally unimportant, are silks, hats, furniture, skins, cotton, and cutlery; the exports comprise all native produce, with linseed, manna, rags, and tanned leather.

Sicily is divided into seven provinces—Palermo, Messina, Catania, Girgenti, Syracuse or Noto, Trapani, and Caltanisetta. The Sicilians are of middle stature, well made, with dark eyes and coarse black hair; their features are better than their complexion; and they attain maturity and begin to decline earlier than the inhabitants of more N. regions. There are 1,000 miles of railroads. Elementary schools are established everywhere, and grammar and commercial schools in the town. There are universities in Palermo, Messina and Catania.

Sicily was originally peopled by the Phœnicians, by the Greeks, next by the Carthaginians, and then by the Romans. The Saracens in the 8th century subjugated the island, and some centuries later the Norwegians made inroads on its territory, and finally it fell under the Nor-

man sway. From this time Sicily became the prey of Spain, France, and Austria, till the crown was united to that of Naples under the title of the Two Sicilies in 1734. When the French overran Italy under Bonaparte, the King of Naples, being driven from his throne, took shelter in this, the insular portion of his dominions, where he reigned in peace, under British protection, till the final peace of 1815 placed him once more in his continental chair of Naples. The revolution in Italy begun by Garibaldi in 1860 soon spread to Sicily, and on the landing of that patriot the whole island rose in arms, and the royal troops were beaten in every engagement. Sicily in a few months was free, and when Naples acknowledged Victor Emmanuel as its sovereign, under the style of King of Italy, the Sicilian crown was laid with rejoicings at the feet of that sovereign. See ITALY.

SICKLES, DANIEL EDGAR, an American military officer; born in New York City, Oct. 20, 1825. He studied law and was admitted to the bar in 1844; was elected to the State Legislature in 1847; became city attorney of New York, and was elected State Senator in 1855. In 1856 the Democratic party of New York elected him to Congress, where he remained till 1861. At the outbreak of the Civil War he organized the "Excelsior Brigade" of New York volunteers, and was commissioned one of its colonels. He was conspicuous for bravery and heroic endurance in the Peninsular campaign; was in the battles near Richmond, Va., in 1862, commanding a brigade; and led a division at the battle of Antietam, Sept. 17, the same year. He was in command of a corps at Chancellorsville, May 2 and 3, 1863, where he was severely wounded. For brilliant achievements at Fredericksburg he was promoted major-general of volunteers. He commanded the 3d Army Corps at Gettysburg, July 2, 1863, and in this engagement lost a leg. He was assigned to the command of the 2d Military District, which included North and South Carolina, in April, 1867. In consequence of having supported the policy of Congress instead of that of President Johnson, he was removed, Aug. 26, 1867; and in 1869 was retired from the army. He was minister to Spain in 1869-1873, when he resigned, returned to New York City, and subsequently held several important civil posts, among them that of president of the Civil Service Commission. He was also a Democratic member of Congress in 1893-1897. He was made a Commander, Medal of Honor Legion, 1902. He died in 1914.

SICYON, a once celebrated city and small state of Greece, situated a few miles S. of Corinth, in the Morea. It was a chief seat of painting and statuary (tradition asserting that the former was invented there), it having given its name to a school of painting which included among its disciples Pamphilos and Apelles, both natives of Sicyon. It was also the native city of Aratus, the noted general of the Achæan League. There exists at the present day a few remains of the ancient city, as well as of the more modern buildings erected by the Roman conquerors of Greece, near which stands a small modern village named Vasiliko.

SIDDONS, SARAH, an English actress; born in Brecon, South Wales, July 5, 1755. She commenced her theatrical career when quite a child, and in her 19th year was married to William Siddons, an actor in her father's (Roger Kemble) company. In 1774 she met with the first recognition of her great powers as an actress at Cheltenham in consequence of her representation of Belvidera in "Venice Preserved." Her success at Cheltenham procured for her an engagement at Drury Lane, but her first appearance there was a comparative failure, and in 1777 she again went on circuit in the provinces. Her second appearance at Drury Lane took place Oct. 10, 1782, in the character of Isabella in the "Fatal Marriage." Her success was complete, and she was universally acknowledged to be the first tragic actress of the English stage. For 30 years she continued to astonish and enchant the lovers of the drama, and having acquired an ample fortune she took her leave of the stage in 1812. Her greatest characters were Queen Catharine in "Henry VIII." and Lady Macbeth. She died in London, June 8, 1831.

SIDDONS, MRS. SCOTT, an English actress; born in India in 1844; the great-granddaughter of Sarah Siddons; was educated in Germany. As Lady Macbeth she made her first professional appearance in England, at Nottingham. She appeared in the United States first as a dramatic reader in New York City, and she made her début as a dramatic star at the Boston Museum about 1868. She died in Paris, Nov. 9, 1896.

SIDGWICK, HENRY, an English philosopher; born in Skipton, Yorkshire, May 31, 1838. He was Professor of Moral Philosophy at Cambridge, and has done much for the promotion of higher education of women, having assisted in the foundation of Newnham College. His valuable works include: "The Methods of Ethics" (1874); "The Principles of Political Economy" (1883), one of the most important works on the subject; "History of Ethics" (1886); "Elements of Politics"

(1891); "Practical Ethics" (1898), etc. He died in 1900.

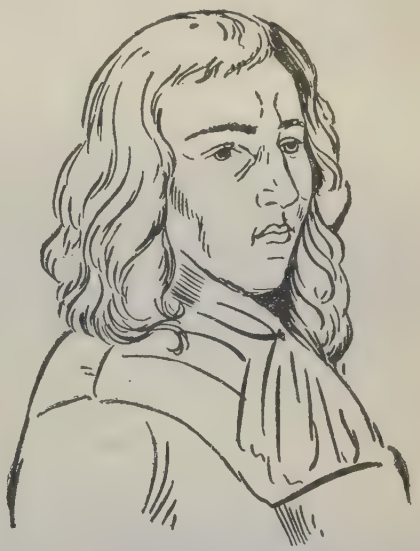
SIDIS, BORIS, an American psychopathologist, born in Russia, in 1867. He came to America in 1887 and received from Harvard the degrees of A.B. in 1894; A.M. in 1895; Ph.D. in 1897; and M.D. in 1908. From 1896 to 1901 he served as associate psychologist and psychopathologist of the Pathological Institute of the New York State hospitals. Practicing his profession in Boston, he was also medical director of a psychotherapeutic institute bearing his name, at Portsmouth, N. H., and at various times an associate editor of the "Archives of Neurology and Psychopathology," and of the "Journal of Abnormal Psychology." His numerous publications include "Multiple Personality" (with Goodhart, 1905); "Experimental Study of Sleep" (1909); "Studies in Psychopathology" (1909); "The Psychology of Laughter" (1913); "The Foundations of Normal and Abnormal Psychology" (1914); "The Causation and Treatment of Psychopathic Diseases" (1916); "The Source and Aim of Human Progress" (1919), etc.

SIDMOUTH, a watering-place on the S. coast of Devonshire, England; 14 miles by road, E. S. E. of Exeter. It lies in a narrow valley at the mouth of the little Sid between the red sandstone cliffs of High Peak (513 feet) on the W. and Salcombe Hill (497) on the E. Its esplanade is protected by a sea wall (1838), 1,700 feet long; and its parish church (1259; almost rebuilt 1860) has a stained W. window inserted by Queen Victoria in memory of her father, the Duke of Kent, who died here in 1820. The climate is mild and the rainfall the least in Devon. Pop. about 6,000.

SIDNEY, a city of Ohio, the county-seat of Shelby co. It is on the Great Miami river, the Miami and Erie Canal, and on the Cincinnati, Hamilton, and Dayton, the Western Ohio, and the Cleveland, Cincinnati, Chicago, and St. Louis railroads. It has important industries, including the manufacture of whips, hollow ware, horse collars, churns, wheels, iron and wood workers' tools, aluminum ware, flour, etc. Its notable buildings include a public library and a court house. Pop. (1910) 6,607; (1920) 8,590.

SIDNEY SUSSEX COLLEGE, a college at Cambridge, England. It began as the Franciscan or Grey Friar's House, established in 1240, and after the Reformation was endowed as a school by the will of Lady Frances Sidney, Countess Dowager of Sussex. Its early career is marked by Puritanism and Irish and Scotch students were first conspicuous in this college at Cambridge. It has a master and ten fellows, twenty-four scholars, and about seventy undergraduates. It has eight livings in its gift. Oliver Cromwell, Thomas Fuller, and Bramhall were among the members.

SIDNEY, or SYDNEY, ALGERNON, an English military officer; born in Penshurst, Kent, in 1622. He accompanied his father, the 2d Earl of Leicester, in his embassies to Denmark and France. He was also early trained to a military life, and served with some distinction in Ireland, where his father was lord lieutenant. In 1643 he returned to England and joined the Parliamentary forces. In 1644



ALGERNON SIDNEY

he was lieutenant-colonel of a regiment of horse in Manchester's army, and was severely wounded at Marston Moor. In 1645 he was given the command of a cavalry regiment in Cromwell's division of Fairfax's army, and was returned to Parliament for Cardiff. He was nominated one of the commissioners to try Charles I., but took no part in the trial, though he approved of the sentence. He refused all concurrence in the government of Cromwell, retiring to Penshurst, but when the return of the Long Parliament in May, 1659, gave expectations of the establishment of a republic, he again took his seat and was nominated one of the council of state. He was soon after appointed a commissioner to mediate a peace between Denmark and Sweden, and while he was engaged in this embassy the Restoration took place. Conscious of the offence he

had given the royal party, he refused to return and remained an exile for 17 years. At length, in 1677, the influence of his friends procured him permission to return to England. After the death of Shaftesbury in 1682, he entered into the conference held between Monmouth, Russell, Essex, Hampden, and others, and on the discovery of the Rye House Plot he was arrested and sent to the Tower on a charge of high treason. He was tried before the notorious Chief Justice Jeffreys, and his trial was conducted with a shameless absence of equity which has conferred on him all the glory of a martyr. He was executed on Tower Hill, Dec. 7, 1683. His "Discourses Concerning Government" were first printed in 1698.

SIDNEY, SIR PHILIP, an English writer, soldier and man of affairs, born in 1554, the eldest son of Sir Henry and Lady Mary Sidney. As a child, he impressed all who knew him for such "lovely and familiar gravity as carried grace and reverence above greater years." He attended Christ Church, Oxford, completing the course at 17. In 1572 he went abroad to study the governments of Europe. At the time of the Massacre of St. Bartholomew he was in Paris. The blackness of the deed, which sent a shudder through all England, affected Sidney very powerfully, and he became identified with the party that held it to be the duty of the English Government to espouse the Protestant cause throughout Europe. He was interested in the political theories of the French Huguenots, and later met Languet in Frankfort, who exerted a great influence on his political ideas. His travels extended through Hungary, Italy, Germany, and the Low Countries. By 1575 he was at home again, and attended the Princely Pleasures at Kenilworth given by his uncle, the Earl of Leicester, who hoped by the entertainment to win the hand of the queen. Soon after, he wrote a sonnet cycle, "Astrophel and Stella," telling his love, after approved court fashion, for the Lady Penelope Rich. In 1577 he again went abroad, this time to Germany, on diplomatic business. On his return he met the young poet Spenser, and became his patron. To him Spenser dedicated his first important series of poems, the "Shepheard's Calender" (1579). Sidney wrote a powerful protest against the projected French marriage, and for his pains was exiled from the court for a time (1580), using his enforced leisure by writing a long pastoral romance, "Arcadia." This romance, which conformed to the ideas of poetry obtaining at the time, was a prose counterpart to Spenser's "Faerie Queene" and exerted considerable influence upon it. It is heroic, dealing with the education and character of the ideal prince; it contains many allegories, part of them being ethical and religious, others directly applicable to persons of the court; and it is related also to the political conditions of the time. It became the most famous of all Elizabethan literary works, excepting only the "Faerie Queene." Soon afterward Sidney wrote a "Defense of Poetry," which is a survey of the state of literature in England at about 1581, an application of Platonic doctrine to the theory of poetry as the loftiest of human disciplines, and an eloquent defense of poetry against the attacks of Gosson and other Puritan defamers.

All these literary activities were in accordance with the idea of the time concerning the true courtier. The idea was that of complete and many-sided development. The courtier must excel in war, in all manly sports and exercises, in knowledge of men and affairs, in statecraft, and in music, art, poetry, and all the learning of the time. Many books were written, in Italy, France, and England, on the subject, and it was carried out in practice in schools founded on true humanistic principles. In "Astrophel and Stella," in "Arcadia," and in his voluminous correspondence, Sidney bears witness to the influence of this ideal as the conscious aim of all his self-training and activities. No small part of his tremendous influence, therefore, lies in the way in which his personality and achievement incarnated the highest cultural ideal of the time. The story of his life and opinions, as related by his friend Fulke Greville and as revealed in his letters, shows the high seriousness, the intelligent patriotism, and the extent of his studies of political conditions in Europe at a time when England's destiny hung in the balance. Thus to his love of literature was added his patriotic service to his prince as a true courtier. He carried the ideal farther than this. He was actively interested in Raleigh's colonizing ambitions, at one time being prevented from going to America only by the express injunction of the queen. He served in Parliament. He held with Leicester and Spenser and Raleigh the view that English safety required active opposition to Philip of Spain, and that it was the duty of England to the world to assume the leadership of the Protestant cause throughout Europe. At length the long fight to induce Elizabeth to intervene in the Low Countries was won. Sidney went with the expedition sent by the queen. In September of 1586 he received the wound at Zutphen from which he died twenty-six days later, young in years but with a record

of many-sided achievements outstanding even in that time of boundless activity. As men of all nations had looked to him as a leader and had dedicated to him books in every field of human knowledge, so at his death every nation bore tribute to him. The mere list of the poetical tributes to his memory is without parallel elsewhere. But his greatest achievement was himself. His personality exerted a fascination not only on his contemporaries but on succeeding ages. He won immortality, not through his actual work, varied and worthy as that work was, but through himself.

SIDON (Hebrew, Zidon), anciently a city of Phœnicia; on the E. coast of the Mediterranean; half way between Tyre and Beyrout. It soon rose, both by its exceptional position and the enterprising character of its inhabitants, to the first position among the cities of Phœnicia, so that the whole country is sometimes designated by the name Sidon. The colonies extended over the coast of Asia Minor, the adjacent islands, Thrace and Eubœa, and even some parts of Sicily, Sardinia, Spain, northern Africa, in fact, nearly the whole of the ancient world. The Sidonian manufactures of glass and linen, purple dye and perfumes, were sources of vast wealth. At length it surrendered to Shalmaneser, King of Assyria. But under Assyrian, Chaldean, and Persian domination it retained a kind of independence for its internal affairs, and under the Persians reached its highest prosperity. An unsuccessful revolt against Artaxerxes Ochus ended in its temporary ruin (351 B. C.). Speedily rebuilt and repeopled, it opened its gates to Alexander the Great (333 B. C.), and from that time forth it fell successively into the hands of Syrian, Greek, and Roman rulers. Through the Middle Ages little is heard of it, except that it was taken by the Crusaders. The present town of Saida has 15,000 inhabitants, of whom 7,000 are Mohammedans. In the neighborhood are numerous rock-cut burial-places of the ancient Phœnicians, in which have been found the sarcophagus of Eshmunazar, King of Assyria, and others. The town was stormed by the allies under Napier in 1840.

SIEBENGEBIRGE, a small mountain range of Germany, on the right bank of the Rhine, not far from Bonn. Seven mountains tower above the rest, of which the Drachenfels, close to the Rhine, and presenting a splendid view from the river, is the most beautiful. On all of them are ruins of ancient castles.

SIEDLCE, the chief town of the former Russian province of the same name, in Poland; 40 miles E. by S. of Warsaw. The seat of a Roman Catholic bishop, it has a fine palace, girt with beautiful gardens, and carries on important industries. Pop. about 30,000. Considerable fighting occurred here during the World War. The province lying between the Vistula and the Bug nearly corresponds to the old palatinate of Polachia, area, 5,534 square miles; pop. province, 1,000,000. It now is part of the republic of Poland.

SIEGE, literally a sitting down. When the assault of a fortified place would be too hazardous and costly and its reduction by blockade too slow, recourse is had to the "regular siege or systematic attack." In order to cross the open ground swept by the fire of the fortress with as little loss as possible the besieger makes use of sunken roads or trenches. The revetments having been breached by his artillery or mines, he continues these roads through the breaches into the place. To prevent these "approaches" being enfiladed by the guns of the fortress they are made at first in zigzags; the prolongations of which are directed so as to clear the works of the fronts attacked, and, when a direct advance becomes necessary, they are provided with traverses at short intervals, or "blinded sap" is used—*i.e.*, a trench covered in with timber and earth. Two or three such lines of approach are used. To protect and connect them lateral trenches are formed from which large bodies of troops can fire upon any sortie that may be made. These are termed "parallels," being parallel to the general front of the parts attacked.

The ancients used to surround the place attacked with a high bank of earth, called a "line of circumvallation" and protected themselves against attack from the outside by another called a "line of contravallation," and a similar arrangement was in vogue till the middle of the 19th century. Now a covering field army is employed, which by its greater mobility, is able to meet the relieving army many miles from the besieging force, and a chain of fortified localities takes the place of the continuous line of circumvallation. In order that a siege may be safely undertaken the strength of the besieger should be about four times that of the garrison. In 1870 Strasburg, with a garrison of 20,000, was captured by a besieging force of 60,000 strong. Metz was starved into surrender, the presence of so many men (some 170,000) besides the proper garrison only hastening that result.

The "siege parks," or main depôts, for the artillery and engineer trains must be out of range of the enemy's guns, containing as they do powder, ammunition, guns, and warlike stores of all descrip-

tions. The batteries necessary are "enfilade" batteries, placed on the prolongations of all the important works attacked; "counter" batteries, to overcome the fire of the works bearing upon the field of attack; "mortar" and "howitzer" batteries, to search by high angle fire the interior of all the works attacked; and "breaching" batteries, to breach by curved fire the scarps and flanking casements. Light pieces, such as the seven-pounder mountain guns and machine guns, are placed in the second and third parallels, and in the "demi-parallels" or lodgments, 100 to 150 yards long, made on each approach about half way between these parallels.

Beyond the third parallel the besieger will probably be met by counter mines, and himself have to resort to mining in order to carry out the crowning of the covered way. The World War developed a more or less new system of siege. See WORLD WAR: ARTILLERY.

Siege in History.—Among great sieges in the world's history may be mentioned those of Troy, Tyre (572, 332 B. C.), Syracuse (396 B. C.), Saguntum (219 B. C.), Jerusalem (A. D. 70), Acre (1192, etc.), Calais (1347), Orleans (1428), Constantinople (1453), Haarlem (1572-1573), Leyden (1574), Breda (1625), Rochelle (1628), Magdeburg (1631), Breisach (1638), Taunton (1644-1645), Londonderry (1689), Gibraltar (1731, 1779, 1782-1783), Prague (1741-1744), Leipsic (1757, 1813), Quebec (1759-1760), Seringapatam (1799), Genoa (1800), Saragossa (1808-1809), Ciudad Rodrigo (1810, 1812), New Orleans (1814), Antwerp (1832), Rome (1849), Sebastopol (1854-1855), Kars (1855), Lucknow (1857), Delhi (1857), Gaëta (1860-1861), Vicksburg (1863), Charleston (1864-1865), Richmond (1864-1865), Metz (1870), Strasburg (1870), Belfort (1870-1871), Paris (1870-1871), Plevna (1877), Khartum (1884), Ladysmith (1900), Port Arthur (1904), Adrianople (1912); Liége (1914), Przemysl (1914-1915); Verdun (1915-1916).

SIEGE ARTILLERY. See ARTILLERY.

SIEGEN, a town of Prussia, in Westphalia, on the Sieg river; 47 miles E. of Cologne; manufactures leather, paper, linen, soap, iron, copper, lead, zinc, etc., having many mines in the vicinity. Siegen was the birthplace of Rubens. Pop. about 27,300.

SIEMENS, WERNER VON, a German engineer and electrician; born in Lenthe, Hanover, Dec. 13, 1816. In 1834 he entered the Prussian artillery, and in 1844 was put in charge of the artillery workshops at Berlin. He early showed scientific tastes, and in 1841 took out his first patent for galvanic silver and gold plating. He was of peculiar service in developing the telegraphic system in Prussia, and discovered in this connection the valuable insulating property of gutta-percha for underground and submarine cables. In 1849 he left the army, and shortly after the service of the state altogether, and devoted his energies to the construction of telegraphic and electrical apparatus of all kinds. The well-known firm of Siemens and Halske was established in 1847 in Berlin; and subsequently branches were formed, chiefly under the management of the younger brothers of Werner Siemens, in St. Petersburg (1857), in London (1858), in Vienna (1858), and in Tiflis (1863). Besides devising numerous useful forms of galvanometers and other electrical instruments of precision, Werner Siemens was one of the discoverers of the principle of the self-acting dynamo. He also made valuable determinations of the electrical resistance of different substances, the resistance of a column of mercury one meter long and one square millimeter cross section at 0° C. being known as the Siemens unit. His numerous scientific and technical papers, published in the "Proceedings" of the Berlin Academy (of which he became a member in 1874), in Poggendorff's "Annalen," in Dingler's "Polytechnische Journal," etc., were republished in collected form in 1881. In 1886 he gave 500,000 marks for the founding of an imperial institute of technology and physics; and in 1888 he was ennobled. He died in Berlin, Dec. 6, 1892.

SIENA, or SIENNA, a city of central Italy, on three connecting hills on the S. frontiers of Tuscany, 59 miles S. of Florence, is surrounded by old walls, entered by nine gates, and has also a citadel; the streets are irregular, steep and narrow. It has a university with faculties of law and medicine, and a cathedral, begun in the early years of the 13th century, which is one of the finest examples of Italian Gothic architecture. The municipal palace, begun in 1288, is a fine specimen of Pointed Gothic. It stands in the historic Piazza del Campo, now the Piazza di Vittorio Emmanuele, a large open semicircular space in the center of the city, and is adorned with frescoes of the Sienese school. The institute of fine arts contains a valuable collection of pictures of the oldest Sienese painters. There are various other buildings of interest, including churches and palaces. The manufactures are not of much importance. In the Middle Ages Siena gave its name to a school

of painting, and was the birthplace of famous painters, sculptors, and architects. It was long the powerful rival of Florence, but was annexed by Tuscany in 1557. Siena is the seat of an archbishop. Pop. commune about 41,700.

SIENA CATHEDRAL

SIENKIEWICZ, HENRYK, a Polish author; born in Lithuania in 1845. He was the author of the historical novels "Quo Vadis," "The Deluge," and "With Fire and Sword." The next books were "Pan Michael" and "Ian Wolovyjswki." Later works were: "Children of the Soil," "Knights of the Cross," "Let Us Follow Him," etc. He was awarded the Nobel Prize for literature in 1905. At the outbreak of the World War he removed to Switzerland. He was active in behalf of the sufferers from the war in Poland, and was president of the General Relief Committee for Polish victims. He died in 1916.

SIENNA, or **SIENNA EARTH**, a ferruginous ochreous earth, which when raw is of a fine yellow color, and when burned assumes a rich orange-red tint. It is used as a pigment in both oil and water-color painting.

SIERRA, a chain of hills or mass of mountains with jagged or saw-like ridges.

SIERRA LEONE, a small British colony and a protectorate on the W. coast of Africa. The colony occupies the peninsula, Sherbro Island, some small isles and a coast-strip between French Guinea and Liberia. Area, 4,000 square miles. The protectorate extends inland and is bounded by French Guinea on the N., by

Liberia, E. and S. E. Area, 27,000 square miles. Principal products: palm kernels, cola nuts and gum copal. Exports in 1919 were valued at £2,101,569; imports at £2,123,344. There are 169 elementary schools. A college at Fourah Bay, to prepare natives for the ministry, is supported by the Church Missionary Society. Pop. of colony about 75,500; of Protectorate, about 1,400,000, mostly negroes. There are about 700 whites. Sierra Leone was purchased by Great Britain in 1787 from the native chiefs, for the purpose of a settlement for liberated negroes, and to aid in the suppression of the slave trade. Capital, Free Town. Pop. 34,000.

SIERRA MADRE ("Main Chain"), a general name for the mountains that in Mexico stretch N. from about Guadalajara to Arizona, forming the W. wall of the plateau, and separating Chihuahua from the maritime States of Sinaloa and Sonora. Along the E. foothills of the range, in northwest Chihuahua, the country is very fertile. The so-called Sierra Madre plateau, on the United States frontier, is a continuation of the Chihuahua plateau. The name has often been more widely extended, however, to include the central and E. ranges of the Cordilleras.

SIERRA MORENA, a chain of mountains in Spain, between New Castile and Andalusia, separating the Guadiana on the N. and the Guadalquivir on the S., and attaining a height of 5,500 feet above sea-level.

SIERRA NEVADA, a chain of mountains in southern Spain, the most elevated in the peninsula. The greater part of it is in the province of Granada, running E. and W., and the highest peak in Mulahacen, which has an elevation of about 11,678 feet, and is capped with everlasting snow. The range is rich in fertile valleys and picturesque scenery.

SIERRA NEVADA, a mountain range of California, extending N. and S. along the E. boundary of the State. It consists of an aggregate of ranges, on an average some 70 miles wide, with numerous peaks reaching an elevation of 10,000 and 15,000 feet. Gold mining, timber cutting, and sheep rearing are important industries in these ranges.

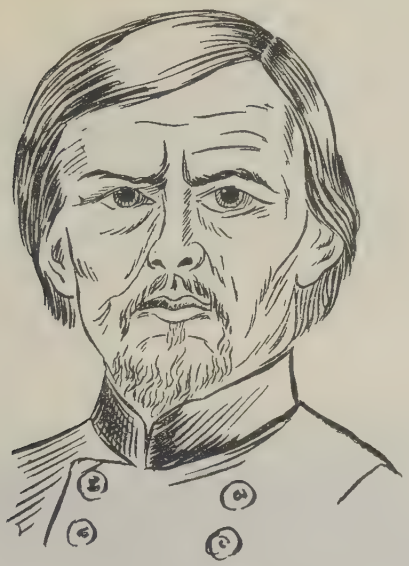
SIESTA, the name given to the practice indulged in by the Spaniards, and the inhabitants of hot climates generally, of sleeping two or three hours in the middle of the day, when the heat is too oppressive to admit of their going from home.

SIEYÈS, EMMANUEL JOSEPH, better known as the Abbé Sieyès, a French revolutionist; born in Fréjus, France, May 3, 1748, and pursued his studies for the Church at Paris. He was active in furthering the progress of the Revolution, and soon acquired great influence in the National Assembly. He originated the idea of the new geographical division of France into departments, arrondissements, and communes. In 1791 he became a member for the Seine department, and in 1792 deputy for the department of Sarthe. During the Reign of Terror he withdrew into the country, but after Robespierre's downfall he returned to the convention and took an active part in affairs. In 1799, on his return from a mission to Berlin, by which he secured the neutrality of Prussia, he became a member of the directory. He subsequently suppressed the Jacobin Club, and was active in bringing about the overthrow of the directory and the substitution of the consular government by the revolution of the 18th Brumaire, the new constitution being devised by him. Sieyès soon found his speculations completely overmatched by Bonaparte's practical energy, and though a consul provisionally, he saw it desirable to terminate his political career. He retired with the title of count, and obtained grants of land and property to the value of at least $250,000. He was exiled at the restoration, but returned on the July revolution of 1830, and died in Paris, June 20, 1836.

SIFTON, SIR CLIFFORD, a Canadian lawyer, born in Middlesex, Ontario, in 1861. He was educated at the High School, London, Ont.; the Boys' College, Dundas; and Victoria University, Cobourg. In 1882 he was called to the Manitoba bar and in 1895 became Q. C. He was elected to the Manitoba Legislature for North Brandon in 1888 and continued a member until 1896. He entered Sir Wilfred Laurier's administration as Minister of the Interior in 1896 and resigned in 1905. He represented Canada at the International Conference of Conservation of Resources at Washington in 1909, and resigned as chairman of the Commission for Conservation of Natural Resources in 1918.

SIGEL, FRANZ, an American military officer; born in Sinsheim, Baden, Nov. 18, 1824; was graduated at the military school at Carlsruhe in 1843 and commissioned a lieutenant in the army. When the Baden revolution began he raised troops; assumed the leadership of the insurrection; and was made Secretary of War and Commander-in-Chief of the army. He came to the United States in 1852, and when the Civil War broke out, organized a regiment and went to the front, where he served with unusual distinction, being promoted Major-General.

Subsequently he settled in New York City, where he entered politics; was made collector of internal revenue in May, 1871;



FRANZ SIGEL

register of the city in October, 1871, and pension agent in 1886; later was head of an advertising bureau and editor and publisher of the "New York Monthly." Died August, 1902.

SIGHT, in physiology, one of the five human senses, having for its organ the EYE (*q. v.*). In this organ, then, we have the retina, an expansion of the optic nerve, to receive and transmit to the brain the impressions of light; certain refracting media for so disposing the rays of light traversing them as to throw a correct image of an external body on the retina; and a contracting diaphragm, with central apertures for regulating the quantity of light admitted into the eye. When the eye is directed to any object, an image of that object is depicted on the back of the eye by means of the rays of light entering the pupil, and duly refracted by the different humors. The image, which is inverted, produces, somehow, an impression on the retina with the assistance of the choroid coat, and this impression passes inward to the nervous centers, whence the optic nerve takes its rise. The subject of binocular vision, or that with two eyes we only perceive one object, was long a perplexing subject to philosophers, till it was satisfactorily explained by means of that now well-known instrument the STEREOSCOPE (*q. v.*).

The power of adapting the eye to vision at different distances has received the most varied explanations; but the opinion now generally entertained is that it depends mainly on some alteration, either in position or form, which takes place in the crystalline lens. Some persons possess this power of adaptation in a very slight degree, and thus labor under defective vision, of which there are two kinds. Nearsightedness (myopia) is caused by anything—such as undue convexity of the cornea—which increases the refracting power of the eye, and so causes the image of an object to be formed at a point anterior to the retina, and is remedied by the use of concave glasses. Long-sightedness (hypermetropia), on the other hand, is owing to conditions the reverse of this, and is remedied by the use of convex glasses, which diminish the focal distance of an image formed in the eye. We judge of the motion of an object partly from the motion of its image over the surface of the retina, and partly from the motion of our eyes following it; and of the form of bodies, partly from the mere sensation, and partly from the association of ideas.

In law, bills of exchange are frequently drawn payable "at sight" (*i. e.*, on presentation), or a certain number of days "after sight." In the last case the time begins to run from the period of presentment and acceptance. "Sight draft" and "Sight bill" are bills payable at sight.

SIGISMUND, EMPEROR OF GERMANY AND KING OF HUNGARY AND BOHEMIA, second son of the Emperor Charles IV.; born in 1368. On the death of his father, in 1378, he became Margrave of Brandenburg, and was occupied four years in visiting his states, and receiving their homage. He married, in 1385, Maria, daughter of Ludwig Louis, King of Hungary, and was crowned king the same year. He soon after extended his dominions by the conquest of the Wallachia. His queen dying in 1392, his claim to the crown of Hungary was contested by Ladislaus V., King of Poland, but unsuccessfully; and the frequent conspiracies formed against Sigismund by the nobles made him suspicious and cruel. Alarmed by the conquests of the Turks, he sought aid of France and England; and a great battle was fought at Nicopolis in 1396, in which the French, under the Count of Nevers, were defeated and almost all slain, the Hungarians fled without fighting, and Sigismund narrowly escaped and led a wandering life for 18 months. In 1410 he was chosen emperor by one party of the electors, Jobst, Marquis of Moravia, being chosen by another party, and Wenceslaus, who had been deposed, still retaining the title

of emperor. At the same period there were also three rival Popes.

But the death of Jobst and the acquiescence of Wenceslaus left Sigismund without a rival in the following year. He was crowned at Aix-la-Chapelle in November, 1414, and went thence to the great Council of Constance. He surrounded the town with his troops, and remained master of its gates during the council. The Bohemian reformer, John Huss, had come to Constance under a safe conduct of the emperor; but he was nevertheless burnt, as was also his disciple, Jerome of Prague. Sigismund had a conference with the Pope, Benedict XIII., at Perpignan, hoping to induce him to resign the tiara, but he failed. About the same time he sold Brandenburg to Frederick of Hohenzollern, Burgrave of Nuremberg; raised Savoy into a duchy for Amadeus VIII., and visited France and England. He professed to negotiate a peace between Charles VI. and Henry V., but perfidiously made a secret alliance with the latter, hoping to recover Arles. By the death of his brother, Wenceslaus, in 1419, he succeeded to the crown of Bohemia, and the Hussite war began, which lasted 15 years. The famous Zisca defeated Sigismund before Prague in 1420, but agreed to a truce, and Sigismund was crowned soon after. After the death of Zisca the war was ably carried on by the two leaders, named Procopius the Great and Procopius the Less. In 1431, Sigismund was crowned King of Italy at Milan; and in 1433, Emperor of Rome by Eugenius IV. He died Dec. 9, 1437.

SIGISMUND I., KING OF POLAND, THE GREAT, son of Casimir IV.; born Jan. 1, 1467; and succeeded his brother, Alexander, in 1507. He died April 1, 1548.

SIGISMUND II., surnamed AUGUSTUS; born Aug. 1, 1520, was son of the preceding, and succeeded him in 1548. He died in 1572.

SIGISMUND III., surnamed DE VASA; born in 1566, was son of John III., King of Sweden, and of Catharine, the daughter of Sigismund I. He was elected King of Poland in 1587, and succeeded to the crown of Sweden in 1594. Being a Catholic, his uncle, Charles, Duke of Sudermania, easily undermined his authority in Sweden, and he lost that kingdom in 1604. In 1610 he succeeded in placing his son, Vladislaus, on the throne of Russia, but was afterward obliged to succumb, and besides that, was involved in a war with Gustavus Adolphus. He died in Warsaw in 1632.

SIGN, in astronomy, a portion of the ecliptic or zodiac, containing 30 degrees, or a 12th part of the complete circle. The first commences at the point of the equator through which the sun passes at the time of the vernal equinox; and they are counted onward, proceeding from W. to E., according to the annual course of the sun, all round the circle. The names of the 12 signs, in the order in which they follow each other, are as follows: Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Pisces. It is to be remarked that the above are also the names of the 12 constellations of the zodiac; and in ancient times (more than 200 years before our era), the places of the signs and the constellations were coincident; but owing to the motion of the earth's equator, by which the equinoctial points are carried backward on the ecliptic about 50′ 6″ annually, the intersections of the ecliptic and equator, and consequently the commencement of the signs, now correspond to different stars, the first point of the sign Aries being at present near the beginning of the constellation Pisces. On this account care must be taken not to confound the signs of the zodiac, which are fixed in respect of the equinoxes, with the constellations, which are movable in respect of those points.

In algebra, a symbol indicating an operation to be performed, or a relation subsisting between two quantities. Of the former kind, those most commonly used are, + for addition, — for subtraction, × for multiplication, ÷ for division, $\surd$ for the square root, $\sqrt[3]{}$ for the cube root, $\sqrt[n]{}$ for the nth root, etc. The sign denoting relations are, = equal to, > greater than, < less than, etc.

SIGNALING AND TELEGRAPHING, MILITARY. The art of transmitting information by visual signals is of very ancient origin, and has, no doubt, been practiced by all races in every part of the world. The simplest form of signal is, probably, the beacon fire, used for centuries to warn neighboring tribes of the approach of enemies and for other purposes. Very early in history, however, the art of signaling for military purposes reached a high stage of development, and even in these days of telegraphy, telephony and wireless telegraphy, communicating by visible signs still has its uses. In the modern army, the standard equipment used for signaling is a flag attached to a light pole, but any other easily visible object may be used, a torch or lantern being employed at night time. The two systems most commonly used are the Morse code and the Myer code. The former makes use of a system of dots and dashes, a definite number of dots and dashes representing each letter of the alphabet. Thus, *a* is represented by ·—, *b*

by—..., and so on. The signaler holds his flag perpendicularly, and to send a message moves it through an angle of 45 for a dot, or of 90 for a dash. The Myer system represents each letter of the alphabet by a series of numbers. Thus, *a* is 22, *b* is 2112, *c* is 121, and so on. The signaler holds his flag perpendicularly, and then moves it through an angle of 90 to the right for 1, 90 to the left for 2, and straight down in front of him for 3.

The heliograph signals by means of a mirror, or a combination of two mirrors, reflected sun flashes taking the place of movements of a flag. When the sun is in front of the operator, only one mirror is needed. When the sun is behind the operator, two mirrors are required, one to reflect the sun from the first mirror to the second, the other to reflect it from the second mirror to the receiver.

Military telegraphy differs in no essential from ordinary telegraphy, but special equipment is, of course, required. The wires are strung on light poles, or may even lie on the ground. They are carried on a reel, supported either on a man's back or on a light cart. Wireless telegraphy is rapidly rendering the use of a cable unnecessary.

SIGNALS, the means by which communications are made to greater distances than can be reached by the human voice. To the eye these are conveyed by flags, lights, etc., and to the ear by guns, steam-whistles, fog-horns, etc. The most complete systems of signaling are those devised to enable ships some distance apart to communicate with each other. Of these the most important ones in the United States navy are the international code, the secret naval code, the wig-wag system, the Ardois night signal code, and a system of wireless telegraphy invented by officers of the navy. The wig-wag system is the simplest of all, and in most general use when vessels of a fleet are lying in close proximity to each other. It is carried on by means of a small flag of conspicuous color, mounted on a staff some six or seven feet long. This is held by the person sending the message and is waved down, or to the right or left, in accordance with an understood arrangement. The international code, which is used by all vessels at sea, consists of 27 flags, of which there are 19 square ones, 6 pennants and 2 burgees. These flags represent letters, and in order to spell out a message combinations of three or four, having the same meaning in all languages, are hoisted to the top of the signal mast.

SIGNATURE, in music, in writing music in any key with sharps or flats, the sharps and flats belonging to the key, instead of being prefixed to each note as required, are placed together immediately after the clef on the degrees of the staff to which they belong; and this collection of sharps or flats is called the signature. In printing, a letter or figure at the bottom of the first page of each sheet, to denote the order of the sheet and to facilitate the arrangement of them for binding.

SIGOURNEY, LYDIA (HUNTLEY), an American author; born in Norwich, Conn., Sept. 1, 1791. Among her many publications are: "Pleasant Memories of Pleasant Lands," a record of her visit in Europe made in 1840 (1842); "Scenes in My Native Land" (1884); "Water Drops: A Plea for Temperance" (1847); "Gleanings," poems (1860); and "The Man of Uz, and Other Poems" (1862). She died in Hartford, Conn., June 10, 1865.

SIGSBEE, CHARLES DWIGHT, an American naval officer; born in Albany, N. Y., Jan. 16, 1845; was graduated at the United States Naval Academy in 1863; served in the Gulf blockading squadron during the latter part of the Civil War; and participated in the battle of Mobile Bay. After the war he commanded a Coast Survey vessel, and served for several years in the hydrographic office of the Navy Department at Washington. He invented a deep-sea sounding apparatus and was permitted to accept the Order of the Red Eagle from the Emperor of Germany in recognition of his services in superintending its construction abroad. As captain he was assigned to the command of the battleship "Maine" in 1897. During the Spanish-American War he commanded the auxiliary cruiser "St. Paul," which rendered excellent service as a naval scout. The deepest valley in the Gulf of Mexico is named "Sigsbee's Deep," after Captain Sigsbee, and the scientific name of *Sigsbeia murrhina* is given to one of the rarest species of deep-sea fauna. It was Sigsbee, too, who discovered near the Morro light, many beautiful specimens of the pentacrini, or sea lilies. In 1898 Captain Sigsbee was given command of the battleship "Texas," and in 1900 became chief of the bureau of naval intelligence. In 1903 he was commander of the navy yard at League Island, Pa. He was commander of the S. Atlantic Squadron, 1904-1905; of the N. Atlantic Fleet, 1905-1906. He retired in 1907. He was the author of "Deep-Sea Sounding and Dredging," "Personal Narrative of the Battleship Maine," etc.

SIGURD, or **SIGURDR**, in Northern mythology, the hero of the Volsunga Saga, on which the "Nibelungenlied" is based. According to the legend of the Volsungs, Sigurd (the Siegfried of the "Nibelung-

enlied)" is the posthumous son of Sigmund, son of Volsung, a descendant of Odin. After obtaining the golden treasure by slaying the dragon Fafnir with his good sword, Gram, he eats the monster's heart, and thus acquires the power of understanding the songs of birds. He then rides through a volume of flame surrounding a house in which the fair Brenhyldr (Brunhild) lay asleep. He wakes Brenhyldr, to whom he plights his troth, and then rides to the palace of Giuki the Niflung, whose wife gives him a potion which causes him to forget Brenhyldr, and he marries Gudrun (Chriemhild), Giuki's daughter. Her brother Gunnar (Gunther) determines to marry Brenhyldr, but is unable to ride through the flames; so his mother by her arts causes Sigurd to go through the flames and bring away Brenhyldr in the form of Bunnar. Sigurd then resumes his shape, and Brenhyldr is handed over to Bunnar. When Brenhyldr hears the true story of her rescue, her love for the hero turns to hatred, and she seeks to slay him. Sigurd is eventually killed by Gunnar's half brother. His death revives Brenhyldr's love, and she dies of a broken heart.

SIKHS, a religious sect in Hindustan, which worships one only and invisible God. Its founder was Nanak Shah, born in 1469 in the province of Lahore. He labored to lead the people to a practical religion, to a pure worship of God and love to mankind. He died about 1540. Of his successors, Arjun-mal gave stability and unity to the religion by publishing Nanak's writings in the Adi-Granth, the first sacred book of the Sikhs. The Sikhs had now rejected the authority of the Koran and the Vedas, and thus aroused the enmity both of the Mohammedans and Brahmans. Arjun-mal was thrown into prison, where he died. His son and successor, Har Govind, transformed the Sikhs from peaceful believers into valiant warriors, and under his reign began the bloody contest with the Mohammedans. The real founder of the Sikh state was Govind Sinh or Singh, the 10th ruler from Nanak. He abolished the system of castes and gave all men equal rights. His followers, owing to their valor in the protracted contest with the Mohammedans, received the title of Sinhs or lions. Govind Sinh wrote the Dasema Padshah ke Granth, or book of the 10th prince, which, besides treating of religious subjects, contained the history of the author's exploits. The Sikhs hold it in equal veneration with the Adi-Granth. Govind Sinh died in 1708, and the Sikhs gradually yielded to the superior power of the Mohammedans. A small number of the Sikhs escaped to inaccessible mountains, and preserved the doctrines of their fathers and an inextinguishable hatred toward the Mohammedans. After Nadir Shah's return to Persia they left the mountains and subdued all Lahore. The Sikhs then broke up into a number of independent communities, each governed by a sirdar; but in 1792 Runjeet Singh established himself as despotic ruler of the Sikhs, with the title of Maharajah. After Runjeet Singh's death in 1839 a period of anarchy followed. In 1845 (first sikh war) the sikhs were defeated by Sir Hugh Gough at Ferozeshah and again in January and February of 1846, by Gough and Sir H. Smith. A treaty was signed by which Great Britain held the city of Lahore, and a British resident took supervision of the government. In 1848 a general revolt broke out, and it was evident that the Sikhs had resolved on a decisive struggle, being assisted by the Afghans. In this the second Sikh war, Lord Gough advanced with an army against them, but received a severe check at Chillianwalla, Jan. 13, 1849. Both armies were then reinforced, and on Feb. 21, at Gujerat, the power of the Sikhs was completely broken. The Sikh dominion was proclaimed at an end, and the Punjab was annexed to the British Empire in India, the Maharajah Dhulip Singh receiving an annuity of $245,000. The bulk of the Sikhs are of Jât origin and number over 3,000,000. During the mutiny the Sikhs displayed the utmost loyalty to the British. Bodies of Sikhs did efficient service in France, and in other military areas during the World War.

SI-KIANG, or WEST RIVER, China, by far the most important of the streams which unite to form the Canton river. It is navigable for vessels drawing 12 feet 75 miles from the sea.

SIKINO (ancient Sikinos), a small island of the Cyclades, in the Grecian Archipelago, E. of Melos; area, 17 square miles. The surface is lofty, but the soil is fertile. The staple product is wine.

SIKKIM, a native State in the Himalayas, between Nepal and Bhutan, in political connection with the government of Bengal; area 2,818 square miles. It is important as containing the most direct trade routes from India into Tibet, which have hitherto been kept closed by the jealous influence of the Chinese Government. The ruling family is Buddhist in religion and of Tibetan descent. In 1836 the sanitarium of Darjeeling was ceded to the British in consideration of a payment at first of $3,000, now of $6,000, per annum. In recent years much has been done to develop the transit trade with Tibet. The lieutenant-governor of Bengal has had

repeated interviews with the rajah and his minister. The capital is at Tumlung from November to May; for the rest of the year it is removed to Chumbi, on the Tibetan side of the range. The products are rice, Indian corn, millet, oranges, tea, and cotton cloth; the minerals are lime and copper. Pop. about 88,000.

SILCHESTER, a village in the extreme N. of Hampshire, England; 7 miles N. of Basingstoke; is famous for the remains of the ancient Romano-British town of Caer Segeint, called by the Romans Calleva, and by the West Saxons Silceastre. The chief visible remains are the amphitheater, 50 yards by 40, and the walls, 2,760 yards in length; excavations have shown the foundations of a basilica, the forum, a temple, baths, etc.; and coins, seals, rings, and much broken pottery have been found. New excavations were begun in June, 1890, by the Society of Antiquaries and by 1910 most of the old town was uncovered.

SILESIA (German, Schlesien), a territory of Central Europe, formerly divided politically between Prussia and Austria. Prussian Silesia, the largest of the Prussian provinces, was bounded E. by Posen and Poland, S. by the Austrian territories, W. and N. by Saxony and Brandenburg; area, 15,566 square miles. The province is intersected by branches of the Sudetic mountains in the S., but is level toward Brandenburg and Posen, and though in parts marshy and sandy is yet fertile. The principal river is the Oder. Silesia produces corn, beet-root, flax, madder, hemp, hops, tobacco, fruits, and tolerable wines. The mountainous parts yield timber and afford good pasturage and meadow land. Minerals include iron, copper, lead, silver, coal, sulphur, etc., and there are mineral waters in several places. Linen, lace, cotton, and woolen goods, and leather, glass, earthenware and iron ware are the chief manufactures. Silesia was divided into three governments—Breslau, Liegnitz, and Oppeln. Breslau is the capital. By a plebiscite held in March, 1921, a majority of the people of Upper Silesia elected to remain German, rather than join Poland.

Silesia was annexed to Poland in the beginning of the 10th century. In 1163 it became independent, and was governed by three dukes of the royal house of Piast. At the beginning of the 14th century 17 independent dukes reigned in Silesia at one time, and ruined the country by their feuds. In order to escape the grasp of Poland it acknowledged the sovereignty of the Bohemian kings. In 1675 the ducal line of Piast became extinct, and the country was incorporated in the Austrian dominions. In 1740 Frederick II. of Prussia laid claim to part of Silesia (based on old agreements to which effect had never been given), and in 1763, at the close of the Seven Years' War, a great part of Silesia was ceded to Prussia. Pop. about 5,225,900. By the Peace Treaty of 1919, Czecho-Slovakia obtained 1,996 square miles of Prussian and Austrian Silesia with a population of 608,128.

On October 20, 1921, the Council of the League of Nations defined the Upper Silesian boundary. Germany retained the north and west, but Poland, in the country around Kattowitz and Rybnick, got an important part of the mining district.

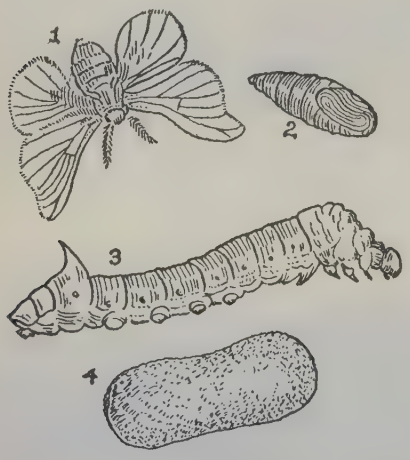
SILICA, oxide of silicon. Pure silica occurs in nature, crystallized in six-sided prisms, terminated by six-sided pyramids in rock crystal and some other forms of quartz. It enters largely into the composition of agate, chalcedony, flint, opal, sandstone, felspar, and a vast number of other minerals. In a perfectly pure state it is quite transparent and colorless. Its hardness is next to that of the precious stones, and it has a sp. gr. of 2.6. Silica presents the general characters of an earthy base, but acts as an acid, forming with the bases compounds known as silicates. These are very abundant in nature; clay, felspar, mica, hornblende, and a large number of other common minerals are compounds of this description.

SILICON, in chemistry, one of the non-metallic elements, the base of silica, discovered by Berzelius in 1823. It is in the form of its only oxide, silica, the most abundant solid element in nature. It is obtained in a state of purity by igniting the double fluoride of silicon and potassium with sufficient potassium to combine with the whole of the fluorine. The mass is washed first with cold, and then with hot water. Silicon thus obtained is a dull-brown powder, sinking in water, in which it is insoluble. It is a non-conductor of electricity, and is insoluble in all acids but the hydrofluoric. Heated in oxygen or air, it burns with a brilliant flame, being converted into silica, its only oxide. If heated in a closed platinum crucible its properties become changed. It is now insoluble in hydrofluoric acid, it is decreased in bulk, and may be heated strongly in air and oxygen without taking fire. Silicon unites with hydrogen, forming a gas spontaneously inflammable in air or oxygen. Equiv., 28; symbol, Si.

SILISTRIA, a town of Rumania (formerly belonging to Bulgaria), on the right bank of the Danube, 66 miles N. E. of Shumbla. For five centuries it was the main defensive point of the Turkish empire on the N. E. It was an ill-built and dirty town till the Crimean War, but

after that time it was considerably improved. Silistria was strongly fortified up to 1878, when the fortifications were decreed, like those of other Bulgarian cities, to be dismantled in accordance with the terms of the Berlin treaty. In May and June, 1854, with a garrison of 15,000, it successfully resisted a siege of 39 days by 60,000 to 80,000 Russians. After the Balkan War Silistria was awarded to Rumania by the Treaty of Bukarest in 1913. Pop. about 15,000.

SILK, the peculiar glossy thread spun by the caterpillars or larvæ of certain species of moths, and a well-known kind of fabric manufactured from it. The chief silk-producing larvæ belong to the



SILKWORM

1. Moth. 2. Chrysalis. 3. Silkworm. 4. Cocoon.

family of the *Bombycidæ*, of which group the common silk moth, *Bombyx mori*, is the most familiar species, being that which is by far the most important in artificial culture. This family of moths is distinguished by the small size of the proboscis, by the thick hairy body; and by the large, broad wings. The common silk moth possesses a short body, stout legs, and white wings, which are marked by black lines running parallel with the wing borders. The female moth deposits her eggs in summer on the leaves of the mulberry tree, *Morus alba*. For hatching artificially the eggs are placed in a room heated gradually up to a temperature of about 80° F. In 8 or 10 days the young appear. The caterpillars are then covered with sheets of paper on which mulberry leaves are spread, and make their way through perforations in the paper to the mulberry leaves, their natural food. The leaves when covered with caterpillars are laid on shelves of wicker work covered with brown paper. When first hatched the larvæ or worms are black and about ¼ inch long. The larval or caterpillar stage lasts from six to eight weeks, and during this period the insect generally casts its skin four times. After casting its last skin the insect is about two inches long, and in 10 days attains its full growth of three inches. The insect's body consists of 12 apparent segments, with six anterior forelegs, and 10 fleshy legs or "prolegs" provided with hooks in the hinder body-segments. The mouth is large, with powerful jaws. At this stage the insect becomes languid, refuses food, and prepares for its next change into the pupa or chrysalis stage.

The Chinese appear to have been the first to render the filamentous cocoon substance serviceable to man, and China is still the chief silk-producing country in the world. Before the reign of Augustus the use of silk was little known in Europe, and the culture of the silkworm was not introduced till the 6th century. It was at first confined to Constantinople, but soon spread to Greece and then through Italy to Spain. When the Duke of Parma took Antwerp in 1585 a check was put on its trade in silk goods, and many of the weavers from Flanders and Brabant took refuge in England. Revocation of the Edict of Nantes (1685) drove hosts of silk workers into exile, 50,000 settling in Spitalfields, London. A silk-throwing machine, constructed on Italian models secretly obtained, was fitted up at Derby in 1718 by Thomas Lombe (afterward Sir Thomas Lombe), who obtained a patent in 1719, and on its expiration received a grant of £14,000 ($70,000) for his services to his country. In France looms were set up at Lyons in 1450, and at Tours in 1470. The first nursery of white mulberry trees was founded by a working gardener of Nismes.

In the manufacture of silk the first operation is the unwinding of the cocoons and the reeling of the silk. For this purpose they are placed in shallow vessels containing hot water, which softens the gummy matter of the cocoons. The ends of the filaments are then conducted by guides to large reels moved by machinery. Four or five (or more) threads from as many different cocoons are thus brought together, and uniting by the gum form one thread. When the cocoon is half unwound the filament decreases 50 per cent. in thickness. The silk thus produced is called raw silk. Before it can be woven into cloth the raw silk must be thrown. This is often a special trade and is usually conducted by machinery in large mills. Previous to throwing, the silk is carefully washed, wound on bobbins, and assorted as to its quality. In the throwing machine it is again unwound from the bob-

bins, twisted by the revolutions of a flyer, and then wound on a reel.

The cultivation and production of silk was commenced in the United States at a very early period. In 1734 eight pounds of silk cocoons raised in Georgia were taken to England by Governor Oglethorpe.

Nearly a century afterward the first silk made by machinery in the United States was manufactured at Mansfield, Conn. (1829). Silk cultivation is now a firmly established industry in California and several other States, and there are extensive silk manufactories at Paterson, N. J., Hartford and South Manchester, Conn., Newton, Groton, Northampton and other points in Massachusetts, Philadelphia, Baltimore, New York, etc. Sewing silks of American manufacture are regarded throughout the world as superior in many respects to those manufactured in Italy or elsewhere in Europe. The same is also true of American-made dress silks and ribbons. The silk crop of the world in 1919 was about 24,100,000 kilos, of which the greater part came from Japan. The production of American factories in the same year was valued at $750,000,000, compared with a value of $250,000,000 in 1914. The imports of manufactures of silk in the United States in 1920 were valued at $87,728,181.

SILL, EDWARD ROWLAND, an American poet; born in Windsor, Conn., April 29, 1841. In 1874 he became Professor of English Literature in the University of California, where he remained till 1882, subsequently removing to Cuyahoga Falls, Ohio. His poetical works are "The Hermitage, and Other Poems" (1867); "The Venus of Milo, and Other Poems" (1882); and "Poems," posthumously issued (1888). He died in Cleveland, O., Feb. 27, 1887.

SILL, LOUISE MORGAN, an American author, born in Honolulu, H. I. She was educated at Mt. Vernon Institute, Washington, D. C. From 1899 to 1905 she was a member of the literary staff of Harper & Bros., and from 1905 to 1910 was an assistant editor of "Harper's Magazine." In 1889 she married G. I. Sill, whom she divorced in 1908. In 1910 she removed to Paris, France. She wrote "In Sun or Shade" (1906); "Sunnyfield" (1909); "Kitty Tipsy-Toe" (1909). She also translated various books from the French, among which are to be mentioned Bordeaux' "Biography of Guynemer" (1918), and Charles des Granges' "History of French Literature" (1919).

SILLIMAN, BENJAMIN, an American scientist; born in North Stratford, Conn., Aug. 8, 1779; was graduated at Yale College in 1796 and admitted to the bar in 1802. At the solicitation of President Dwight, of Yale, he abandoned law to devote himself to science, and in 1802 was chosen Professor of Chemistry and Natural History at Yale. In 1807 he wrote the earliest authentic account of a fall of a meteor in America. In 1811 he began a series of experiments with the compound blowpipe and obtained for the first time in the United States the metals sodium and potassium. He discovered the fusion of the carbons in the voltaic arc in 1822; opened the Lowell Institute in Boston with a course of lectures on geology in 1838; was chosen president of the American Association of Geologists and Naturalists in 1840; and was one of the corporate members named by Congress for the formation of the National Academy of Sciences in 1863. In 1818 he founded the "American Journal of Science," which he conducted as sole editor till 1838 and as senior editor till 1846. Among his numerous publications are: "Elements of Chemistry," "Consistency of Discoveries of Modern Geology with the Sacred History of the Creation and the Deluge," etc. He died in New Haven, Conn., Nov. 24, 1864.

SILLS, KENNETH CHARLES MORTON, an American educator, born at Halifax, N. S., in 1879. He was educated at Bowdoin, Harvard, and Columbia, and, besides receiving degrees from these institutions, also received honorary degrees from the University of Maine, Bates College, and Dartmouth College. From 1901 to 1903 he was an assistant in English at Harvard University; from 1903 to 1904, instructor in English and classics at Bowdoin College; and from 1904 to 1905, tutor in English at Columbia University. In 1906 he returned to Bowdoin College as adjunct professor of Latin, becoming, in 1907, Winkley professor of Latin language and literature; in 1910, dean; in 1917, acting president; and in 1918, president of Bowdoin College. From 1917 to 1919 he was a member of the board of visitors, of the United States Naval Academy. He wrote "The First American, and Other Poems" (1911).

SILO, a store-pit for potatoes or beets; also, a pit in which green fodder is tightly packed to make silage or ensilage.

SILOAM, or SILOAH, a pool in Jerusalem, fed by the waters of the Gihon and forming part of the ancient water-supply system of the city. In 1880 the famous "Siloam inscription" was discovered in the aqueduct. It is the oldest Hebrew inscription known.

SILURIAN SYSTEM, in geology, a term made public by Sir Roderick Murchi-

son in 1839, though he had begun to use it as early as 1835. It implied that, speaking broadly, the rocks so described were well developed in the country of the old Silures. The term has been universally adopted. Murchison divided his Silurian system into Upper and Lower Silurian, contending that the Cambrian system of Sedgwick was not independent, but simply Lower Silurian. Whatever be the case with the Cambrian, the Laurentian system, since established, is unequivocally older than the Silurian. Under the Upper Silurian were ranged in descending order: (1) the tilestone of Brecon and Caermarthen; (2) the Ludlow ironstone and shale, and (3) the Wenlock or Dudley limestone. Under the Lower Silurian: (1) the Caradoc sandstone; (2) the Llandeilo flags and schists. Now the Table of Strata stands thus:

I. Upper Silurian: 1. Ludlow formation; 2. Wenlock formation; 3. Llandovery formation or group.
II. Lower Silurian: 1. Bala and Caradoc beds; 2. Llandeilo flags; 3. Arenig or Stiper Stone Group.

There is a great break between the Upper and Lower Silurian, which are uncomformable, and a greater break between the Upper Silurian and the Devonian. During the early part of the Silurian the land was sinking; during the deposition of the Llandeilo the sea was moderately deep. Algæ, corals, brachiopods, trilobites, and other crustacea, and, in the upper strata, fishes, are the characteristic fossils. The higher vertebrates had not yet appeared. Vast areas in Russia, etc., are covered by Silurian rocks. In America, the Canadian and the Trenton formations are believed to be Lower Silurian; the Niagara formation to be Upper Llandovery and Wenlock, and the Salina, the Lower Helderberg, and the Oriskany to be formations of Ludlow age.

SILVER, a precious metal. It appears to have been known almost as early as gold, and, without doubt, for the same reason, because it occurs very frequently in a state of purity in the earth and requires but an ordinary heat for its fusion. Pure silver is of a fine white color. It is softer than copper but harder than gold. When melted its sp. gr. is 10.47; when hammered, 10.510. Its chemical symbol is Ag. It is next in malleability to gold, having been beaten into leaves only .00001 of an inch in thickness. It may be drawn out into a wire much finer than a human hair, and a wire of silver 0.078 of an inch in diameter is capable of supporting a weight of 187.13 pounds avoirdupois. It excels all other metals as a conductor of heat and electricity. Silver melts when heated completely red hot, and may be boiled and volatilized by a very strong and long-continued heat. When cooled slowly crystals of silver may be obtained. Silver is not oxidized by exposure to the air, or affected by water, but it is blackened or tarnished by sulphuretted hydrogen. The at. wt. of silver is 107.9. Oxide of silver (Ag_2O) is produced by dissolving silver in a solution of nitric acid and precipitating with an alkali. Its sp. gr. is 7.14. The compound called horn silver or chloride of silver (AgCl) is obtained by dissolving silver in nitric acid and mixing the solution with a solution of common salt. Its sp. gr. is 5.550. When exposed to the light it turns to a blackish color, hence its great use in photography. Bromide of silver is the most sensitive to light of any known solid. It is used for coating the "dry plates" employed in photography. When silver is long exposed to the air it acquires a covering of a violet color, which deprives it of its luster; this coating is sulphide of silver. Sulphide of silver occurs native as silver glance. Silver readily forms alloys with iron, steel, lead, tin, and mercury. Of the combinations of acid and silver the most important is nitrate of silver ($AgNO_3$), obtained by dissolving silver in nitric acid. If the silver and acid are pure the solution of silver nitrate is colorless, very heavy, and caustic; it stains the skin and all animal substances an indelible black; after evaporation it deposits, on cooling, transparent crystals of NITRATE OF SILVER (*q. v.*).

There are five important silver ores, native silver, vitreous silver (or silver glance), black silver, red silver, and horn silver. The first is usually found in dentiform, filiform, and capillary shapes, also in plates formed in fissures and in superficial coatings; luster metallic; color silver-white, more or less subject to tarnish; ductile; hardness between gypsum and calcareous spar; sp. gr. 10.47. Native silver occurs principally in veins, traversing gneiss, clay-slate, and other palæozoic rocks, but not usually in great quantity. It often forms a natural alloy with gold. Vitreous silver presents itself in various shapes, and is of a blackish lead-gray color with a metallic luster. It is malleable, about as hard as gypsum, and subject to tarnish; sp. gr., 7.19. It is more or less pure silver sulphide, and has been found almost exclusively in veins along with ores of lead, antimony, and zinc. It occurs in Saxony, Bohemia, Hungary, Mexico, and Peru; and is an important species for the extraction of silver. Black silver generally occurs in granular masses of an iron-black color.

It is sectile and about as hard as gypsum; sp. gr., 6.2. This mineral is a composition of silver (about 68.5 per cent.) with antimony and sulphur and traces of iron, copper, and arsenic. It is found in veins along with other ores of silver, and is a valuable ore for the extraction of silver. It occurs chiefly in Saxony, Bohemia, Hungary, and the American continent. Red silver is found in crystals and often massive, granular, and even as an impalpable powder. It is a double sulphide of silver and antimony, containing on an average 60 per cent. of silver. It occurs in veins with other silver ores, galena, and blende. It is found in various parts of Saxony, also in Bohemia, Hungary, and Norway; but chiefly in Mexico, Peru, and the western United States. Horn silver, or silver chloride, occurs in crystals and also in crusts and granular masses. It contains about 76 per cent. of silver. It is found in the upper parts of veins in clay-slate, and also in beds with other silver ores or with iron ochre. It is not abundant in Europe, but occurs in large masses in Mexico and Peru.

Silver is extracted from its various ores by smelting or amalgamation.

The silver mines of North and South America are incomparably more important than those of all the rest of the world. The Mexican mines were worked before the Spanish conquest, and produced large quantities of silver. There are great deposits of silver in Nevada, Arizona, California, Colorado, Idaho, Montana, New Mexico, and Utah. Silver ore, chiefly argentiferous galena, has also been found in great quantities in the Barrier Ranges of New South Wales.

In the Andes Mountains and adjacent sections are marvelous deposits of silver and other minerals, especially iron and copper. Bolivia is unsurpassed in her possession of extensive and rich silver mines. Peru is but little less fortunate in her silver resources and it is said more than 2,000 yielding mines are within her boundaries. At Hualgayoc, in northern Peru, and at the base of the W. spur of the Andes, there are within 40 square leagues 400 silver mines, some of them yielding 300 ounces to the ton. Indians are employed to work in these mines and their only tools are drills, hammers, and raw-hide sacks. They fairly burrow through the mountain, gathering only the richest parts of the ore.

Considerable quantities of silver are produced in Europe. The average production of Germany (before the World War) was about $8,000,000. In Great Britain silver is obtained from argentiferous lead ore.

The following is the production of silver in the United States in 1919:

State or Territory	Fine ounces	Value
Alaska	690,151	$ 773,570
Arizona	5,702,911	6,392,222
California	1,153,614	1,293,051
Colorado	5,966,606	6,687,790
Georgia	8	9
Idaho	5,933,076	6,650,207
Illinois	6,000	6,725
Maine	4,142	4,643
Michigan	425,610	477,054
Missouri	75,991	85,176
Montana	15,012,258	16,826,790
Nevada	7,045,395	7,896,972
New Mexico	851,821	954,781
North Carolina	19	21
Oregon	236,620	265,220
Philippine Islands	15,715	17,614
South Carolina	2	2
South Dakota	122,068	136,822
Tennessee	97,554	109,345
Texas	539,483	604,690
Utah	12,542,623	14,058,650
Vermont	2,200	2,466
Virginia	8	9
Washington	258,270	289,487
Wyoming	300	336
	56,682,445	$63,533,652

SILVER QUESTION. See BIMETALLISM: BRYAN, WILLIAM JENNINGS; MCKINLEY, WILLIAM.

SILVESTER I., Pope, elected in 314. The Arian heresy commenced in his pontificate, and he distinguished himself against the Donatists. He died 336.

SILVESTER II., was at first a monk in Auvergne, but his superior talents exciting the envy and hatred of his companions, he withdrew from the monastery and went to Spain. The Duke of Barcelona took him to Italy where he was noticed by the Emperor Otho, who gave him an abbey, which he afterward quitted, and proceeding to Germany became preceptor to Otho III. He was afterward tutor to the son of Hugh Capet, by whom he was made Archbishop of Rheims. By the interest of Otho he gained the papacy in 999. He was a man of considerable learning, particularly in the mathematical sciences. He died in 1003.

SIMBIRSK, a government of eastern Russia. It is bounded on the N. by Kazan, on the S. by Saratov, and it has an area of 19,110 square miles. The surface is mountainous and in the west is intersected by rivers. The soil is fertile, and agriculture is developed, while the forests yield much timber. Hats, boots and bags are made in the towns. Pop. (1915) 2,124,500.

SIMBIRSK, the capital of the government of Simbirsk, Russia. It is situated on the right bank of the river Volga, about 579 miles S. E. of Moscow. Its situation is elevated and picturesque and it has handsome gardens. It is the center of a horse-raising region, has some distilleries, and an annual fair. Pop. about 70,500.

SIMCOE, a lake in the province of Ontario, Canada. It is about 30 miles long, and 18 miles broad, situated between Lake Ontario and the arm of Lake Huron called Georgian Bay, into which it discharges its waters through Lake Couchiching and the Severn. It contains numerous islands, and is generally frozen over in the winter, so as to be passable with safety for sleighs.

SIMEON, surnamed STYLITES, a Christian fanatic who acquired immense fame by passing the last 47 years of his life on the tops of ruined pillars. He flourished, if such a word is at all applicable to him, from 392 to 459.

SIMFEROPOL, a town of southern Russia; in the Crimea; capital of the former province of Taurida; on the Salghir, 49¾ miles N. E. of Sebastopol. It consists of a European and a Tartar quarter (Ak-Mechet) and is surrounded by productive gardens and orchards. It has several churches, four mosques, large barracks, and government buildings, and exports a great quantity of fruit. Pop. about 84,000.

SIMILE, in rhetoric, a figure by which two things are considered with regard to a third that is common to both. To have a just notion of similes they must be distinguished into two kinds; one common and familiar, as where a man is compared to a lion in courage, and another more distant and refined, as where two things which have in themselves no resemblance or opposition are compared with respect to their effects; as where a comparison is instituted between a flower and a song, with reference to the emotions they produce in the mind.

SIMLA, the chief town of a district of the same name in the Punjab, and the most important hill sanitarium in British India; about 170 miles N. of Delhi. Situated on a series of wooded hill ridges, covered with deodars, rhododendrons and an innumerable variety of ferns, and with an equable temperature that rarely exceeds 70°, Simla is a perfect elysium to Anglo-Indians who have come from the burning plains of Hindustan or the swamps of Bengal. For many years it has been the permanent headquarters of the supreme government of India for more than six months of the year. This tract of hill country was first acquired by the British in 1816, as a result of the Gurkha War, and has since been augmented by purchase, lapse, and exchange. The first house was built in 1819. There are now churches, schools, hotels, clubs, banks, etc. The district of Simla which is entirely surrounded by petty native States, has an area of 18 square miles. The crops are wheat, Indian corn, ginger, and poppy. The neighboring mountains yield lead, iron, and slate. Pop. about 15,000 in winter; 35,000 in summer. Pop. of district 50,000.

SIMMONS, FRANKLIN, an American sculptor; born in Webster, Me., Jan. 11, 1839; first came into prominence in 1865-1866 when, at Washington, D. C., he produced several life-size bronze medallions of the members of the cabinet and prominent army and navy officers. In 1868 he went to Rome, Italy. He has executed over 100 portrait busts in marble, and numerous public monuments, including statues of General Grant and Roger Williams in the National Capital, and numerous ideal statues, busts, etc. A fine specimen of his work, "The Promised Land," is in the Metropolitan Museum, New York. He died in 1913.

SIMMONS, FURNIFOLD McLENDEL, American Senator; born in Jones co., N. C., Jan. 20, 1854. He was admitted to the bar in 1875. In 1887 he was elected as a Democrat to Congress. In 1893 he became Internal Revenue collector for four districts in North Carolina, and acted as chairman of the Democratic Executive Committee in six campaigns. In 1901 he was elected to the United States Senate, and again in 1907, 1912, and 1918. From 1913 to 1920 he was chairman of the Finance Committee of the Senate.

SIMMONS COLLEGE, an institution for the higher education of women, founded in Boston, in 1899, from bequests left by John Simmons, a Boston merchant, who died in 1870. It was opened in 1902. Its courses include household economics, secretarial and library studies, general science, philanthropic work, salesmanship, nursing, etc. There were in 1919 125 instructors and 1,111 students. President, H. LeFavour, Ph.D.

SIMMONS COLLEGE, a coëducational institution for higher education, at Abilene, Texas, founded in 1891. It is under the control of the Baptist denomination. In 1919 there were 30 instructors and 862 students. President, J. D. Sandafer.

SIMMS, WILLIAM GILMORE, an American author; born in Charleston, S. C., April 17, 1806. His publications include: "Atalantis: A Tale of the Sea" (1832), the longest and most noted of his poems; "The Yemassee" (1835; revised ed. 1853); "Castle Dismal" (1845); "The Wigwam and the Cabin; or, Tales of the South" (1845-1846); "The Maroon, and Other Tales" (1855); and "War Poetry of the South" (1867). He died in Charleston, June 11, 1870.

SIMNEL, LAMBERT, an impostor who was put forward by a party of malcontent leaders of the York faction early in the reign of Henry VII. He was trained to personate Edward Plantagenet, Earl of Warwick, son of the murdered Duke of Clarence. Simnel was crowned at Dublin, and landed with his followers in Lancashire. They were totally defeated near Newark, June 16, 1487, when most of the leaders in the recent rebellion perished. Simnel ended his days as a domestic in the royal service.

SIMON, SIR JOHN (Allsebrook), a British lawyer and public official; born in 1873. He was educated at Fettes College, Edinburgh, and Wadham College, Oxford, and was president of the Oxford Union Society in 1896. He became one

SIR JOHN SIMON

of the counsel for the British Government in the Alaska Boundary Arbitration in 1903, and chairman of the Departmental Committee on Street Trading in 1909. In 1910 he was a member of the Royal Commission on Justices of the Peace and solicitor-general in 1910-13; attorney-general, 1913-15; home secretary, 1915-16; major in the air force in France, 1917-18.

SIMON, JULES FRANÇOIS, a French statesman; born in Lorient, Morbihan, Brittany, Dec. 27, 1814; was a disciple of Victor Cousin, the great French philosopher, and when 25 years of age succeeded him in the chair of philosophy at the Sorbonne. After the revolution of 1848 he was elected to the assembly from the Côtes-du-Nord, taking a seat with the Moderate Left. In March, 1849, he was elected to the Council of State, and resigned his seat as deputy in April, to devote himself to lectures and the editing of "La Liberté de Penser." In 1863 he was elected to the Corps Législatif, where he served till the fall of the empire, when he was placed with Thiers and Gambetta at the head of the provisional government, whose affairs he administered during the siege. From the conclusion of peace in 1871 till the fall of Thiers he was prominent in the Assembly at Bordeaux and at Versailles, and in 1875 was elected a life senator. He was the senior representative of France at the Labor Congress of Berlin convoked by the Emperor William II.; was made permanent secretary of the Academy of Moral and Political Sciences in 1882, and from 1875 was a member of the French Academy. He died in Paris, France, June 8, 1896.

SIMONDS, FRANK HERBERT, an American journalist and newspaper editor, born in Concord, Mass., in 1878. After graduating from Harvard, he went as correspondent to Porto Rico during the Spanish-American War. Afterward he became a reporter on the staff of the New York "Tribune," where he remained until he was sent to Albany as legislative reporter for this paper. In 1905 he joined the staff of the New York "Evening Post," with which he remained until 1908 when he joined the editorial staff of the New York "Morning Sun." In 1913 he became editor of the New York "Evening Sun," which position he held until he took charge of the editorial page of the "Tribune," in 1915. Mr. Simonds attracted general attention by his able military and political articles during the World War, his expert knowledge of politics in southern Europe bringing him to the notice of European statesmen. He is the author of "They Shall Not Pass — Verdun, 1916"; "History of the World War" (5 vols.), 1917.

SIMONY (so called from its resemblance to the sin of Simon Magus), in English law, an offense consisting in the presentation to an ecclesiastical benefice for a reward. By 31 Eliz. c. 6, a simoniacal presentation is declared void, and two years' value of the benefice forfeited, one-half of the forfeit to go to the crown, the other half to the person suing; and the person accepting the benefice is forever debarred from holding it. An act of

George IV., however, legalizes engagements for the resignation of ecclesiastical preferments in favor of one of two persons specially named, being by blood or marriage an uncle, son, grandson, brother, nephew, or grand-nephew of the patron. The bond must be entered into before the presentation, and entered in the registry of the diocese. The resignation in terms of the bond will be void unless one of the presentees named in it is presented within six months after notice of resignation has been given to the patron.

SIMPLON, a mountain of the Alps, in the S. of Switzerland, separating the canton of Valais from the Piedmontese territory. The old road across it being impracticable for heavy carriages, a new one, called the Route of the Simplon, was formed by order of Napoleon I. at the joint expense of France and the kingdom of Italy. Though the ascent is everywhere gradual, the highest point of the road is nearly 6,600 feet above the level of the sea. The length is 38 miles, and the width between 25 and 30 feet. It is carried through several tunnels, over upward of 600 bridges, and has 20 station houses for travelers. The road of the Simplon, long regarded as one of the greatest feats accomplished by modern engineering, has become of less importance since the formation of a railroad. The Simplon tunnel, completed in February, 1905, is larger than either that of St. Gothard or Mt. Cenis. It is 12½ miles long as against 8 miles for the Mt. Cenis and 9.3 miles for the St. Gothard.

SIMPLON TUNNEL, a tunnel through the Alps, designed to give France and Switzerland direct communication by rail with Milan, the greatest distributing point in Italian trade. Work was begun on the tunnel in 1898, and it was completed Feb. 24, 1905.

The Simplon tunnel begins in Switzerland near the little town of Brig, in the valley of the Rhône, Canton Wallis, and ends in the valley of the Diveria, on the Italian side near Isella. It is perfectly straight, except for a small curve at the ingress and egress. The tunnel was opened for traffic on Jan. 25, 1906, when the first passenger train passed through.

SIMPSON COLLEGE, a coeducational institution in Indianola, Ia.; founded in 1867 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 28; students, 528; president, J. W. Campbell, Ph.D.

SIMS, JAMES MARION, an American surgeon; born in Lancaster, S. C., Jan. 25, 1813; studied medicine at Charleston and Philadelphia, and having begun practice had his attention specially drawn to some of the special diseases of women, for which he gained a distinguished name, introducing new instruments and operations. He was instrumental in getting a woman's hospital established in New York; subsequently practiced for some years in Europe; and had charge of a large hospital at Sedan after the disaster to the French there in 1870. He died in New York City, Nov. 13, 1883.

SIMS, WILLIAM SOWDEN, an American naval officer; born at Port Hope, Canada, in 1858. He was appointed to the United States Naval Academy from Pennsylvania. Graduated in 1880, he

ADMIRAL WILLIAM S. SIMS

was promoted through the various grades to the rank of commander in 1907, of captain in 1911, of rear-admiral in January, 1917, and of vice-admiral in May, 1917. His various assignments included service with the North Atlantic Station (1880-1882 and 1885-1887); on the "Colorado" (1882); at the New York Navy Yard (1883-1885); on the nautical schoolship "Saratoga" (1889-1893); on the "Philadelphia," Pacific Station (1893-1894); on the "Charleston," China Station (1894-1896); naval attaché of American embassies at Paris and Petrograd (1897-1900); various assignments with

the Asiatic Fleet (1900-1902); inspector of target practice, Bureau of Navigation, Navy Department (1902-1909); naval aide to the President (1907-1909); commanding officer of the "Minnesota" (1909-1911); Naval War College, Newport, R. I. (1911-1913); commanding officer of the Atlantic Torpedo Flotilla (1913-15); commanding officer of the "Nevada" (1915-1917). During the World War he was in command of the naval operations of the United States in European waters. In 1920 he made an extensive report to the United States Senate sub-committee on Naval Affairs, alleging that grave errors had been committed by the United States Naval Board in connection with the management of the United States Naval operations during the World War. This report resulted in an extensive controversy between Admiral Sims and Secretary of the Navy Daniels. In 1919 Admiral Sims declined the D. S. M. which had been awarded to him. He received the Grand Cross of the Order of St. Michael and St. George, was made a Grand Officer of the Legion of Honor, and held honorary degrees from Yale and Harvard universities and from Tufts and Juniata colleges.

SIN, a condition that is not simply moral evil as recognized by the awakened human conscience, but guilt before God or the gods. Some doctrine of sin, and of the mode of averting the anger of the deity, of reconciling Him, and of escaping from the guilt, is accordingly part of most religions, ancient and modern. Zoroastrianism is a conflict of sin and holiness. The central doctrine of Buddhism turns on the demerit of human actions and human life, which must be purged by transmigration. But in no sacred books is the sense of sin so keen and developed as in the Bible—in the writings of the prophets of the God of holiness, in the Psalms, in the Gospels, and in Paul's epistles.

Throughout the Scriptures sin appears as that element in man which puts him at enmity with God, and for his salvation requires the work of a Redeemer (see CHRISTIANITY). The early Greek fathers regarded sin as opposition to the will of God, and as such involving death as its just penalty. But they did not affirm that the guilt of Adam's sin or the corruption of his nature descended to all mankind. Tertullian, in virtue of his doctrine of TRADUCIANISM (*q. v.*), was bound to hold that sinfulness had been propagated from Adam to his descendants. But it was reserved for Augustine to maintain, against Pelagius, that Adam's sin completely corrupted his whole nature; that the corruption of his guilt and its penalty death pass to all his children. PELAGIUS (*q. v.*) maintained contrary doctrines, and semi-pelagianism insists that in spite of the weakening of his powers through hereditary sinfulness man is yet not wholly inclined to evil. The Greek Church continued to deny hereditary guilt, and to affirm man's will as free as Adam's before the fall. Thomas Aquinas taught that hereditary sin is truly sin, and the unbaptized infant is damned. At the Reformation both Luther and Calvin asserted what they regarded as Augustinian and Pauline views. Zwingli looked on hereditary sin as an inherited evil or disease; Arminians and Socinians practically denied hereditary sin altogether. In modern German speculation the Hegelians taught that sin was a necessary condition of the development of mankind.

The doctrine of the Thirty-nine Articles (Art. ix.) is as follows: "Original sin standeth not in the following of Adam (as the Pelagians do vainly talk); but it is the fault and corruption of the nature of every man, that naturally is engendered of the offspring of Adam, whereby man is very far gone from original righteousness, and is of his own nature inclined to evil, so that the flesh lusteth always contrary to the spirit; and therefore in every person born into this world it deserveth God's wrath and damnation."

The Westminster Confession teaches (chap. vi.): "By this sin" (*i. e.*, the eating of the forbidden fruit) "they" (*i. e.*, our first parents) "fell from their original righteousness and communion with God, and so became dead in sin, and wholly defiled in all the faculties and parts of soul and body. They being the root of all mankind, the guilt of this sin was imputed, and the same death in sin and corrupted nature conveyed to all their posterity, descending from them by ordinary generation. From this original corruption, whereby we are utterly indisposed, disabled, and made opposite to all good, and wholly inclined to all evil, do proceed all actual transgressions."

Sins have been divided into categories, as sins of omission and of commission, deliberate voluntary sins and involuntary sins, sins of infirmity, etc.

SINAI, a mountain, or mountain range in Arabia Petræa, in the peninsula formed by the two arms of the Red Sea, and rendered memorable as the spot where, according to the Pentateuch, the law was given to Israel through Moses. This mountain pass is divisible into three groups: a N. W., reaching, in Mount Serbal, an elevation of 6,340 feet; an E. and central, attaining, in Jebel Katherin, a height of 8,160 feet; and a S. E., whose

highest peak, Um Shaumer, is the culminating point of the whole Sinaitic range. Serbal, with its five peaks, is the most magnificent mountain in the peninsula, and is identified with Sinai by the earlier Church fathers, Eusebius, Jerome, Cosmas, etc.; but it does not meet the requirements of the Hebrew narrative, and even as early as the time of Justinian the opinion that Serbal was the Sinai of Moses had been abandoned, and to a ridge of the second or E. range that honor had been transferred, the N. summit of which is termed Horeb; and the S. Jebel Mûsa, or Mount of Moses, continues to be regarded by the great majority of scholars as the true Sinai. Its height is variously estimated at from 6,800 to 7,100 feet above the sea. It is separated from the Jebel-ed-Deir on the W. by a narrow valley, called Er-Rahah, on one of the steps of which stands the famous convent of Mount Sinai, devoted to St. Catherine. In many of the western Sinaitic valleys the more accessible parts of the rocky sides are covered by thousands of inscriptions, usually short, and rudely carved in spots where travelers would naturally stop to rest at noon, frequently accompanied by a cross and mingled with representations of animals. The inscriptions are in unknown characters, but were at first ascribed to the ancient Israelites on their way from Egypt to Sinai, and afterward to Christian pilgrims of the 4th century. Recently, however, many of them have been deciphered by Professor Beer of Leipsic, who regards them as the only known remains of the language and characters once peculiar to the Nabathæans of Arabia Petræa.

SINALOA, one of the Pacific States of Mexico; area, 27,557 square miles. Pop. (1912) 329,317. Capital, Culiacan (pop. 22,000). It contains over 100 mining districts chiefly producing silver. The annual sale of cattle is about $9,000,000. Crops, $8,000,000. Revenue, $11,000,000.

SINCLAIR, originally ST. CLAIR, a Scotch family of Norman origin, founded by William de Santo Claro, who settled in Scotland and received from David I. the grant of the barony of Roslin. The earldoms of Orkney, of Caithness, and of Rosslyn have been especially connected with this family, which at one time was one of the most powerful in the kingdom.

SINCLAIR, MAY, an English novelist, born at Rock Ferry, Cheshire, England. She was educated at the Ladies' College, Cheltenham, and at an early age began the writing of essays, short stories, and novels. Her first notable success was "The Divine Fire," published in 1904. This attracted wide attention and won her immediate reputation. This was followed by "The Helpmate" (1907); "The Judgment of Eve" (1908); "The Combined Maze" (1913); "The Three Sisters"

UPTON SINCLAIR

(1914); "The Belfry" (1916); "The Tree of Heaven" (1918). During the World War she served as a nurse in Belgium. She was considered one of the foremost of modern English novelists.

SINCLAIR, UPTON (BEALL), an American novelist and socialist, born in Baltimore, in 1878. After graduating from the College of the City of New York in 1897, he immediately took up literature as a vocation, but at first without much success. In 1903 he published "The Journal of Arthur Stirling," supposed to be the diary of a young poet who had committed suicide. Much editorial indignation was vented on Sinclair when it was discovered that he had written the work and was still alive, only serving to bring him into public notice. In 1906 he published the first book which made him famous, "The Jungle," which, in fiction form, gave such a picture of labor conditions in the packing house industry in Chicago that the entire American public was horrified. President Roosevelt immediately ordered an investigation, whose report indicated that Sinclair had, on the whole, stated the actual facts. As a result stringent legislation was passed, known as the Pure Food Acts. Since

then Sinclair has written a number of novels, none of which has attracted much attention. Among these are "The Industrial Republic" (1907); and "The Brass Check" (1920); the latter an alleged expose of American journalism.

SIND, SINDH, or SCINDE, a province of British India, in the N. part of the presidency of Bombay. It consists of the lower valley and delta of the Indus, and is bounded on the W. and N. W. by Baluchistan and Afghanistan; N. E. by the Punjab; E. by Rajputana; and S. by the Runn or Ran of Kach and the Indian Ocean; area, 46,980 square miles; pop. about 3,500,000. Divided into six districts: Haidarabad, Karáchi, Shikarpur, Thar and Parkar, Larkhana and Upper Sind Frontier, and also includes the native state of Khairpur (6,109 square miles). The chief city and port is Kurrachee or Karáchi, but the ancient capital Haidarabad is still a populous town.

The history of Sind is of little interest. It was subdued by the Mogul Emperor Akbar in 1580, since which period it has always been either nominally or really tributary. In 1739 it fell under the power of Nadir Shah, but on his death it reverted to the imperial sway of Delhi. From about the middle of the 18th century it was subordinate to Afghanistan. Civil dissension in the end of the 18th century led to the elevation of the Talpur dynasty of the "Ameers." The government then became a wholly unchecked military despotism, upheld by a feudal soldiery. The hostility displayed by the Ameers of Sind toward the British during and after their operations against the Afghans led ultimately to its invasion by British troops, and final conquest by Sir C. Napier's victory at Miani in 1843. Sir C. Napier was appointed its first governor, and it was soon after annexed to the presidency of Bombay.

SINGAN-FU, the capital of the province of Shen-si, in northwest China. It was long the capital of the empire, and is still of strategic and commercial importance. Silk, tea, and sugar are the principal articles of commerce. Pop. about 1,000,000.

SINGAPORE, a British dependency in Asia, the most important of the Straits Settlements; consisting of the islands of Singapore (27 miles long, 14 broad; area, 217 square miles), separated from the S. extremity of the Malay Peninsula by a strait only half a mile wide at its narrowest, and of a great number of very small islands along its shores. The surface is undulating, the highest point reaching 520 feet only. The climate is hot and moist, but the soil is not particularly fertile; nevertheless the island is perpetually clothed with verdure, and yields good crops of coffee, pineapples, cocoanuts, aloes, and every kind of fruit, especially East Indian fruit (*e. g.*, mangosteen and durian). Gambier, pepper, and nutmegs used formerly to be the staple crops; but all three are cultivated to a much smaller extent than formerly. This island was purchased in 1824 from the Sultan of Johore for $62,500, and a life rent of $25,000. Pop. of island (1919) 369,777.

SINGAPORE, the capital of the dependency of the same name, is the only town on the island. It occupies a pleasant site on the S. E. coast, on the Strait of Singapore, the principal waterway for vessels trading between eastern Asia and India and Europe. This city was founded by Sir Stamford Raffles in 1819 as an emporium for British trade in the East Indies, and it has since that time advanced and grown in prosperity till it has become the most important trading-place in the S. E. of Asia, its only competitor being Batavia in Java, from which it is 600 miles distant. Singapore is a picturesque, well-built town, with fine public buildings and all kinds of appliances in the nature of public works. It possesses a governor's residence, St. Andrew's Protestant cathedral (1861-1870), a Roman Catholic cathedral, Mohammedan mosques, Hindu temples, Chinese joss-houses, Raffles museum (1823), the supreme law-courts, post-office (1883), hospitals, jail, barracks, and fine botanical and zoölogical gardens. It is defended by numerous batteries and forts, and is a naval coaling station and depot. The docks, stores, and dwelling houses extend for 6 miles or more along the sea front. The harbor is spacious and safe and remarkably easy of access, and its dock accommodation embraces two graving docks, an admiralty dock, and several docks of the ordinary kind. The total annual trade of Singapore has increased at a remarkable rate since the city was founded. The imports in 1918 were valued at £67,219,285, and the exports at £57,940,969. The imports embrace nearly every kind of European manufacture, while the exports consist of the productions of the East Indies, China, Japan, and the islands of the Western Pacific. The tonnage of the vessels entering the port has been known to increase at the rate of 75 per cent. annually. The vessels of the P. and O. Company, and other large companies trading to China, Australia, and the East put in regularly at Singapore. The population has grown at the same rapid rate as the commerce: in 1824 the town had 10,603 inhabitants; in 1919 about 325,000. The death rate

is high, yet the climate, in spite of Singapore being situated little more than 1° N. of the equator, is uniform and agreeable, the nights being particularly cool and refreshing. The thermometer ranges between 67° and 94° F. and has a mean of about 82°. The rainfall varies from 65.6 to 92.2 inches in the year. There was a former town on the site of the present city, which was founded by Malay converts to Hinduism from Java or Sumatra, apparently in the 12th century; but it had wholly disappeared when Sir S. Raffles laid the foundations of the existing Singapore (*i. e.*, "Lion City"). It was made the capital of the STRAITS SETTLEMENTS (*q. v.*) in 1830, superseding Penang.

SINGER, ISIDORE, an American Jewish editor and author, born at Weisskirchen, Moravia, in 1859. He was educated in the universities of Vienna and Berlin, and for a time edited and published a newspaper in Vienna. He served as secretary and librarian of the French Ambassador at Vienna and afterward was an employee in the French Foreign Office. After editing papers in France and Italy, he came, in 1895, to New York, where he engaged upon his life work, the "Jewish Encyclopedia," which was published in 12 volumes, in 1905. He was managing editor of the "International Insurance Encyclopedia," in 1909, and of the "German Classics of the Nineteenth and Twentieth Centuries," completed in 20 volumes, in 1914. He was the author and editor of many works and was considered to be one of the most learned men of his time.

SINGLE STANDARD, a phrase used in the discussion of BIMETALLISM (*q. v.*), to indicate a single standard of value; that is gold alone or silver alone. Double standard means the concurrent use of both metals as standards.

SINGLE TAX, the principle held by HENRY GEORGE (*q. v.*) and his followers, that the value which the growth and improvement of the community attaches to land should be taken for the use of the community, so that no tax need be levied on the product of labor, but all public revenues for national, state, county, and municipal purposes could be raised by a single tax on land values, irrespective of improvement. The originator urged the adoption of his theory on two grounds, "governmental expediency" and "social justice."

Mr. George stated his theories in "Progress and Poverty," a book that appeared in 1879.

SINGLETON, ESTHER, an American author, born at Baltimore, Md. She was educated at Baltimore. Her works include: "Turrets, Towers and Temples," "Great Pictures," "Wonders of Nature," "Romantic Castles and Palaces," "Famous Paintings," "Historic Buildings," "Famous Women," "Golden Rod Fairy Book," "A Guide to Modern Opera," "Furniture of Our Forefathers," "The Story of the White House," "A Guide to Great Cities," "History of American Music," "The Orchestra and Its Instruments."

SINGMASTER, ELSIE (MRS. HAROLD LEWARS), an American author, born at Schuylkill Haven, Pa., in 1879. She was educated at Radcliffe College. Besides contributing short stories to many prominent magazines, she wrote: "When Sarah Saved the Day" (1909); "When Sarah Went to School" (1910); "Gettysburg—Stories of the Red Harvest and the Aftermath" (1913); "Katy Gaumer" (1914); "Emmeline" (1916); "The Long Journey" (1917); "Life of Martin Luther" (1917); "History of Lutheran Missions" (1917).

SINIGAGLIA, or **SENIGALLIA,** a seaport on the Adriatic coast of Italy; 16 miles N. W. of Ancona; was down to 1869 celebrated for its annual fair, July 20 to Aug. 8. It was founded by the Senonian Gauls, and colonized by the Romans 289 B. C. There are here a cathedral (1787) and a palace of the dukes of Urbino. Pius IX. was born here.

SINOPE (Turkish, Sinub), a town of Asiatic Turkey; on a rocky tongue projecting into the Black Sea; 220 miles W. by N. of Trebizond. It has two harbors, one presenting the finest anchorage along the N. coast of Asiatic Turkey. The town is surrounded by ancient Byzantine walls, and has a ruined castle built under Byzantine influence. The bay was the scene of a naval engagement on Nov. 30, 1853, when a Turkish squadron was destroyed by the Russian fleet. The ancient city of Sinope was founded by a colony of Milesian Greeks, and for several years shared with Byzantium the supremacy of the Euxine. It was made by Pharnaces the capital of the kingdom of Pontus in 183 B. C. The great Mithridates, who was born within its walls, raised it to a lofty pitch of splendor. But in 70 B. C. it capitulated to Lucullus, and in 45 B. C. was made a Roman colony. After belonging successively to the empire of Trebizond (from 1204) and the Seljuks, it was conquered by the Turks in 1461. Sinope was the birthplace of Diogenes the cynic. Pop. about 9,000.

SIOUX CITY, a city and county-seat of Woodbury co., Ia.; on the Missouri river, and on the Chicago, Milwaukee, and St. Paul, the Illinois Central, the Chicago and Northwestern, the Great Northern,

and other railroads; 100 miles N. of Omaha. Here are Morningside College, Trinity College, a high school, college of medicine, a city normal school, St. Joseph, Samaritan, German Lutheran and St. Vincent hospitals, United States government building, public library, sanitariums, auditorium, waterworks, street railroad and electric light plants, several National and private banks, and numerous daily and weekly periodicals. The United States census for 1914 reported manufacturing establishments, employing $22,610,000 capital, and having a combined output valued at $49,452,000. The city contains large slaughtering and meat-packing plants, flour mills, gas engine works, candy factories, brick works, and the general shops of several railroads. Pop. (1910) 47,823; (1920) 71,227.

SIOUX FALLS, a city and county-seat of Minnehaha co., S. D.; on the Sioux river, and on the Illinois Central, the Great Northern, the Burlington, the Chicago, Milwaukee, and St. Paul and other railroads; 90 miles N. of Sioux City, Ia. It contains the Sioux Falls College (Bapt.), Lutheran Normal School, All Saints School, the State penitentiary, the State School for Deaf Mutes, libraries, several National and other banks, and several daily and weekly newspapers. The city is the seat of a Roman Catholic bishop, and of the Protestant Episcopal bishop of South Dakota. It has important jasper quarries, and manufactories of woolen and linen goods, boilers, brick, brooms, flour, soap, etc. The meat-packing industry is important. Pop. (1910) 14,094; (1920) 25,202.

SIOUX, or DACOTAH, INDIANS, a once powerful family of North American Indians. Their number is estimated at 25,000; they are well advanced in civilization and are increasing in population. In 1862, the Sioux under the lead of Little Crow, a noted chief, in consequence of the annuity not having been paid to their satisfaction, waged a most cruel and exterminating war on the whites of Minnesota; and so well concerted were their schemes that no less than 640 men, women, and children, and 94 soldiers, were killed before the massacre was stayed. As an atonement for their great crime in thus murdering the whites the Federal Government allowed only 38 out of 303 Indians found guilty by a proper tribunal, to be executed. This clemency, though seemingly unjust, was the result of mature deliberation on the part of the authorities at Washington, who found that the Indians had been greatly wronged, and in consequence of which they sought revenge. They are now divided into small branches, and located on several reservations, chiefly in North and South Dakota and Minnesota.

SIPHON, a curved tube having one branch longer than the other; used for transferring liquids from higher to lower levels. It acts by atmospheric pressure, and consequently cannot be depended on for overcoming heights greater than about 30 feet near the level of the sea, and a less height at greater elevations.

SIREN, in acoustics, an instrument for determining the number of vibrations corresponding to a note of any given pitch.

In classical mythology, certain melodious divinities who dwelt on the shores of Sicily, and so charmed passing mariners by the sweetness of their song that they forgot their homes and remained there till they perished of hunger. According to one legend, they threw themselves into the sea, from rage and despair, on hearing the more melodious song of Orpheus. Originally there were only two sirens; but their number was afterward increased to three, and their names are given with great variety.

SIRIUS, in astronomy, the dog star, by far the brightest fixed star in the sky. It is *alpha Canis Major*, situated a little below Orion, and is mythologically regarded as one of the hounds held in leash by Orion, Procyon in *Canis Minor* being the other. A line drawn from the Pleiades through the three stars of Orion's belt will pass it closely; straight lines connecting it with Procyon and Betelgeuse will constitute a nearly equilateral triangle; and Aldebaran, Betelgeuse, Sirius, and Regel, all of the first magnitude, form a lozenge-shaped figure, with Orion's belt in the center. Ptolemy, in the 2d century, ranked Sirius among red stars; now it is white, and is a very brilliant object, its light being 324 times as great as that of a star of the sixth magnitude. It is about 1,000,000 times as far from us as the sun, and its mass is about 20 times as great. Viewed by the spectroscope, its chief lines are those of incandescent hydrogen, with feebler ones of sodium and magnesium; the metal mercury seems also to be present. Some irregular movements of Sirius led to the belief that a heavenly body existed near enough to produce a perturbation, and a son of Alvan Clark, of Boston (Mass.), discovered, on Jan. 31, 1862, what appears to be a planet revolving around Sirius as its sun, it is thought in about 49 years. The heliacal rising of Sirius varies in different latitudes, and the procession of the equinoxes makes it do so also in successive ages. When the heliacal rising of Sirius (called by the old Egyptians Sothes) took

place, it indicated to them that the overflow of the Nile was at hand.

SIROCCO, a hot wind storm. Most of the hot winds of the Old World are modified forms of the simoom. The sirocco originates in the Sahara and travels N. to the Mediterranean and southern Europe, but it is not so deadly as the prototype. It brings with it great quantities of the desert sand, and the air becomes so dense at times that the sun is obscured as if by fog. While it remains on the African mainland it is characterized by a very marked dryness, as there are no extensive water surfaces to supply it with moisture. As soon, however, as it is launched over the Mediterranean it begins to take up copious draughts, so that when it reaches Malta, Sicily, and the S. shores of Europe as a wind from between S. E. and S. W., it has undergone a change from a hot, dry wind to a hot, damp wind. The result of this alteration is that it becomes most enervating to the human constitution. During its prevalence iron rusts, clothes spoil with mildew, grapes and green leaves wither, wine will not fine, and paint will not dry. Sicily experiences the sirocco about a dozen times a year, but it is not so frequently met with in other parts of Europe.

SISMONDI (SIMONDE), **JEAN CHARLES LEONARD DE**, a historian; born in Geneva, Switzerland, May 9, 1773. His principal works are: "History of the Italian Republics in the Middle Ages" (16 vols. 1807-1818); "History of the New Birth of Liberty in Italy" (1832); "History of the French" (31 vols. 1821-1834); "History of the Fall of the Roman Empire" (1835); "Julia Severa; or, The Year 492" (1882); "Literature of the South of Europe" (1813). He died in Geneva, June 25, 1842.

SISSON, EDWARD OCTAVIUS, an American educator, born at Gateshead, England, in 1869. He came to the United States in 1882 and was educated at Kansas State Agricultural College, University of Chicago, University of Berlin and Harvard University. From 1886 to 1891 he was a teacher and principal of public schools; from 1892 to 1897 principal of the South Side Academy, Chicago, Ill.; from 1897 to 1904 director of Bradley Polytechnic Institute, Peoria, Ill; from 1905 to 1906 assistant professor of education at the University of Illinois; from 1906 to 1912 professor of pedagogy and director of the department of education at the University of Washington; from 1913 to 1917 State commissioner of education of Idaho; and since 1917 president of the State University of Montana. He was a member of various educational societies and, besides lecturing and contributing articles on educational subjects, he was the author of "The Essentials of Character" (1910); and joint author of "The Social Emergency" (1913); "Principals of Secondary Education" (1914).

SISTAN, an extensive level and lowlying tract on the borders of Persia and Afghanistan, partly filled by the Hamum (Sistan) Lake or swamp. It is divided between Persia and Afghanistan.

SISTERHOODS, societies or communities of women living together under a religious rule, binding upon all, and with a common object for their united life. But in common use the word denotes those communities which are not enclosed, and whose life is one of active labor. An account of the great religious communities of women in the early and Middle Ages of Christianity falls under the head of Monachism. Indeed the state of Christendom for many centuries prevented the possibility of life and work for women such as that of Sisters of Charity. Women were affiliated to the great monastic orders, the Benedictine, Augustine, Carmelite, etc., but, with one partial exception, that of the Hospitalers, "Réligieuse Hospitalières," were invariably cloistered. There were several communities of hospital nuns, the great hospitals of the Hôtel Dieu at Paris, San Spirito at Rome, Dijon Hospital, and several others in France being served by them. But they lived in convents adjoining the hospitals, and only left their cloisters to nurse the sick. Even when the Franciscan and Dominican orders of preaching friars arose, the nuns belonging to them, the Poor Clares and Dominican nuns, were strictly enclosed.

The first sisterhood in England, that founded by Dr. Pusey, was broken up in 1855, after the war in the Crimea, where some of the sisters had worked under Florence Nightingale. A few of the original members of this first English sisterhood joined a small community which had been founded by Miss Lydia Sellon in 1846, called the Society of the Holy Trinity. One of the largest and most important sisterhoods in England was founded in 1851 under the title of "Sisters of the Poor," by Miss Harriet Byron. St. Margaret's Sisterhood was founded at East Grinstead in 1854 by the Rev. Dr. J. M. Neale for the purpose of nursing the sick poor or rich in their homes. The Holy Cross Sisterhood, whose headquarters are at Holy Cross Home, Hayward's Heath, was formed in 1857. One of the most flourishing sisterhoods in England—that of St. Mary's, Wantage—was founded by the Rev. Dr. Butler, afterward Dean of Lincoln, primarily for penitentiary work.

The "Sisters of Bethany," founded in 1866, have their headquarters in Clerkenwell, and are chiefly devoted to education and to mission work in poor parishes. St. Raphael's Sisterhood, Bristol, founded in 1867, follows, as far as possible, the rule of St. Vincent de Paul, and is devoted entirely to the service of the poor; middle-class education and penitentiary work being excluded.

The "Sisters of the Church," Randolph Gardens, Kilburn, founded in 1870 by Miss Emily Ayckbowm, developed with extraordinary rapidity. They have immense schools, teaching many thousands of children, and training homes for teachers.

Besides these large communities there are many smaller sisterhoods in England.

The first Protestant sisterhood in the United States was organized in 1852 by the Rev. W. A. Muhlenberg. The sisters took charge of St. Luke's Hospital, which he founded in 1859. Since then a number of sisterhoods have sprung up all over the country, notable among them being: The Sisterhood of St. Mary, New York City, founded in 1865; the Sisterhood of St. John Baptist, New York City, affiliated in 1881; the All Saints Sisters of the Poor, Baltimore, Md., affiliated in 1890; and the Sisterhood of St. Margaret, Boston, Mass., established in 1873. In 1919 there were 113 Catholic and Protestant sisterhoods at work in the United States, exclusive of deaconesses, whose first home was established in Chicago in 1887.

SISTOVA, a town of Bulgaria; on the Danube, opposite Simmitza; 38 miles S. W. of Rustchuk, beautifully situated on undulating slopes. It has mosques and churches, and carries on manufactures of wine, leather, and wool. Here was signed, on Aug. 4, 1791, a treaty of peace between Turkey and Austria. Sistova was a place of some importance in the Russo-Turkish War. Part of the Russian army crossed the Danube here, and the town fell into their hands on June 27, 1877. Pop. about 14,000.

SISYPHUS, in mythology, a descendant of Æolus, said by some to have lived at Ephyra, on the Peloponnesus, while others allege that he was a robber, slain by Theseus. His punishment in Tartarus for his crimes committed on earth consisted in rolling a huge stone to the top of a high hill, which constantly recoiled, and thus rendered his labor incessant.

SITKA, or **NEW ARCHANGEL**, a port of entry and former seat of administration of Alaska Territory; on the W. coast of the island of Sitka or Baranof; about 1,300 miles N. of San Francisco. It is located amid beautiful scenery, and has a wide and deep harbor, somewhat difficult of entrance. The town contains a hospital, museum, an industrial and public school, the Greek Church of St. Michael, built in 1816, and in which the Russians still maintain the national religion, and a Presbyterian mission, where boys and girls receive an industrial training in connection with the ordinary branches of an English education. The principal business establishment, that of the Russian-American Fur Company, organized in 1799, was located here till 1863. When Alaska was transferred to the United States in 1867, Sitka contained only about 100 log huts. Since then it has made considerable progress and a number of substantial and permanent buildings have been erected. Pop. (1920) 1,175.

SITTING BULL, a chief of the Sioux Indians; born about 1837; was regarded as a great "medicine man" by his tribe; and was an obdurate foe of the whites, even violently repulsing all overtures toward a peaceful understanding. He manifested this hatred from youth till the day of his death. He was conspicuous in the Sioux massacre of 1862; was constantly on the war-path for 14 years; was a leader in the Indian outbreaks of 1876; and was in command at the battle of the Little Big Horn in which General Custer and his entire force were killed. With his band he escaped into Canada, but continued even there to incite rebellion among the Sioux. In 1880, receiving the promise of pardon, he returned to Dakota and surrendered to General Miles. It is a question whether the acceptance of the condition of pardon was sincere, for he again incited the Indians to renewed outbreaks. His arrest was ordered and the Indian police were detailed on this duty. In attempting to resist them, Sitting Bull was killed Dec. 13, 1890.

SIVAS, a town in Armenia, the center of a large and fertile plain watered by the Kizil Irmak, 410 miles E. S. E. of Constantinople. It has numerous mosques, large and well-supplied bazaars, commodious khans, baths, etc. Being on the road from Bagdad, and having easy access to the Black Sea, it commands a considerable trade. Pop. about 65,000.

SIX COMPANIES, an organization of Chinamen with headquarters in San Francisco, Cal., partly benevolent and partly commercial, their functions being to loan money, give advice, act as bankers, care for the sick, and protect their countrymen in all ways. Originally, they guaranteed to send back, dead or alive, the body of every Chinaman who sailed from home to

this country, but they now ship back to China the bones only of those whose families desire those relics buried in the sacred earth of the Flowery Kingdom. They began in 1850 and 1851 hiring men in China to meet the demand for labor in California. The business grew and other Chinese firms went into it. Then the agents of all these firms found it necessary to unite for self-protection. There were six of these agencies, and they called themselves the Six Companies. A contractor in need of newly imported labor goes to one of these companies and gives his order for so many men. He pays the fees for that number to the company he deals with. If he hires laborers already here they will be members of the company, and the charge will be only the rate exacted for the service. The names of the Six Companies are: the Ning Yeung, the Hop Wo, the Kong Chow, the Yung Yo, the Sam Yup, the Yang Wo. The Six Companies have added arbitration bureaus and banking operations to their original scheme.

SIXTUS, the name of several popes:

SIXTUS I., successor of Alexander I. in 119; martyred in 127.

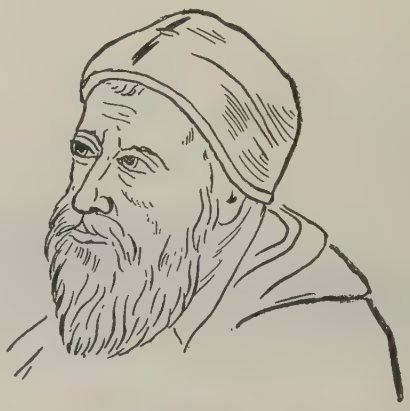
SIXTUS II., the successor of Stephen I. He is stated to have been an Athenian and

SIXTUS IV.

pagan philosopher before his conversion to Christianity. He was one of those who suffered martyrdom in the persecution of the Christians by Valerianus in 258.

SIXTUS III., successor of Celestin I. in 432. He endeavored to reconcile the disputes existing in the Eastern Church, particularly in the case of Cyril, Bishop of Alexandria, and John of Antioch. Some of the epistles which he composed with regard to those controversies are extant, and are included in the collection of Constant. He was also a munificent patron of learning, and is stated to have left 5,000 silver marks to be expended in the embellishment of ecclesiastical structures. He died in 440.

SIXTUS IV.; born in Savona, July 22, 1414; was the son of a fisherman on the coast of Genoa, but became a monk of the



SIXTUS V.

order of the Cordeliers. His abilities procured him the chair of divinity at Padua and other universities of Italy. He also became general of his order, and was honored with the cardinalship by Paul II., whom he succeeded in 1471. He is accused of having been a participator in the conspiracy of the Pazzi, the object of which was to destroy the Medici family. He also endeavored to raise a new crusade against the infidels, but without success. He died Aug. 13, 1484.

SIXTUS V. (Felice Peretti), Pope; born near Montalto, Dec. 13, 1521. He entered the convent of the Cordeliers at Ascoli, and by his natural good abilities and his popularity as a preacher made his way rapidly, notwithstanding a petulant temper and frequent contentions with his associates. He was successively Professor of Theology, commissary-general of his order at Bologna, and inquisitor at Venice, whence he fled to Rome and obtained still higher honors and offices. A remarkable change appeared in his character or manners—he showed himself meek and amiable. Pius V., who had been his pupil, got him chosen general of the Cordeliers, named him his confessor, and in 1570, created him cardinal. He was not in favor with Gregory XIII., and it is said that in his retirement he feigned great feebleness. These signs of old age vanished the moment of his election as successor to Gregory in April, 1585. He threw away his staff, and made the place ring with his loud *Te Deum*. His first care was to repress brigandage. One

year of his vigorous government made an immense and beneficial change. Before the end of 1585 Sixtus published a bull of excommunication against Henry of Navarre and the Prince of Condé. After the murder of the Duke of Guise and the Cardinal of Lorraine, he cited Henry III. of France to Rome, and on his non-appearance excommunicated him. During the five years of his pontificate Sixtus formed and executed many great designs for the improvement and adornment of Rome. He caused the famous granite obelisks which Caligula had brought from Egypt to be set up on a pedestal; completed a great aqueduct for the supply of Rome with water; rebuilt the library of the Vatican, and established the celebrated printing office in connection with it; and yet left the treasury rich. Sixtus confirmed the order of "Feuillants"; established or reformed many congregations for the management of secular or ecclesiastical affairs, and fixed the number of cardinals at 70. He died in Rome, Aug. 27, 1590.

SKAGEN, CAPE, or **THE SKAW,** the extreme N. point of the province of Jutland, Denmark. A lighthouse, 67 feet high, built by Frederick II. in 1564, is situated on the cape. The village of Skagen, close by, has 2,000 inhabitants.

SKAGER RACK, a broad arm of the German Ocean, which washes Norway on the N., Jutland on the S., and Sweden on the E., where it communicates with the Cattegat; length, W. S. W. to E. N. E., about 150 miles; breadth, 80 miles. Its depth varies from 30 to upward of 400 fathoms. There are several good harbors on the Norwegian and Swedish coasts.

SKAGWAY, a town on Chilkat Inlet, Alaska; at the head of Lynn canal, and at the entrance to the White Pass. It is a result of expeditions to the Yukon gold fields in 1897, when the White Pass began to be used as a means of reaching the Klondike and its vicinity. Skagway is a landing-place for steamers and a distributing point for supplies to and from the Canadian Klondike. Its name is derived from the Indian name of a river which flows into the sea near the town. Pop. (1920) 494.

SKATE, in ichthyology, the popular name of any individual of a section of the genus *Raia*, differing from the rays proper in having a long pointed snout. *R. batis*, the true skate, is one of the commonest fishes in European waters, and attains a large size. The upper part of the body is dusky gray or mottled. The long-nosed skate (*R. vomer*), between four and five feet in length, has the snout excessively prolonged. The Burton skate (*R. marginata*) is thicker and heavier than the true skate, and is frequently eight feet

SKATE

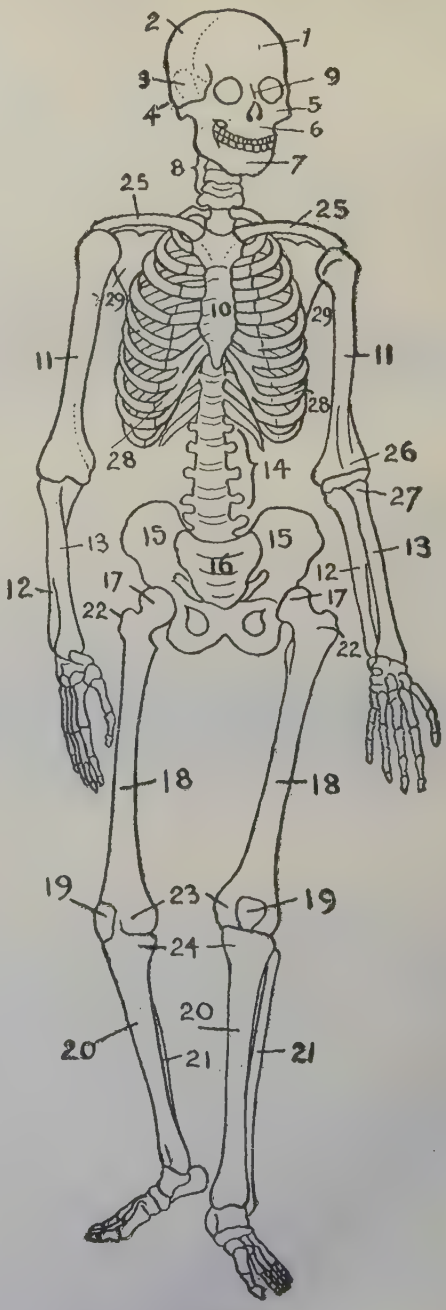
long; the shagreen skate, or Ray (*R. fullonica*), is rather less than three feet long.

SKATING, progression on ice accomplished by means of instruments composed of steel blades which are fastened to the soles of the boot, and which are called skates. In early times the shinbones of animals were bound to the feet, and skaters glided over the frozen surface on these by propelling themselves with the aid of a spiked stick. At a later period the iron or steel blades were introduced, the cutting edge of which enabled the wearer to dispense with the stick, and to push off with one foot and glide on the other with alternate strokes. Skates are now of two kinds—viz., those made for speed skating and those for figure skating. Both were formerly constructed by inserting the steel blade into a wooden bed, which was approximately shaped to the foot and bound to it by means of leather straps. Modern skates are made entirely of metal, and are fixed either by screws passing through plates (to which the blade is attached) into the sole of the boot, which form of skate is known as the Mount Charles; or they are fixed to the boot by various mechanical devices which enable the skate to be quickly and firmly attached to the boot, and as quickly removed.

SKEAT, WALTER WILLIAM, an English Anglo-Saxon scholar; born in London, Nov. 21, 1835. In 1883 he became Professor of Anglo-Saxon at Cambridge; was one of the founders of the English Dialect Society; and an authority on early English literature. He edited "The Vision of William Concerning Piers Plowman" (1867-1885); Barbour's "The Bruce" (1870-1889); "Specimens of English Literature, 1298-1579" (1871 and 1872; "The Works of Chaucer" (1894); numerous poems, metrical romances, etc.; compiled "An Etymological Dictionary of the English Language" (1879-1881; 1884); and wrote "A Student's Pastime" (1896); "Notes on English Etymology" (1901), etc. He died in 1912.

SKELETON, a general term for the more or less hard parts of animals, whether forming an internal supporting framework—an endoskeleton, or an external exoskeleton, often useful as armor.

Skeleton of Invertebrates.—Many of the Protozoa have shells of lime, or of flint, or of some organic substance, such as acanthin. These are formed by the living matter of the units, in the case of the lime and flint shells from materials absorbed from the surrounding water, but in what precise way we do not know. Almost all sponges are supported by loose or firmly fused spicules of lime or of flint, or have, as in the bath spone, an interwoven supporting skeleton of "horny" fibers. The spicules or fibers are formed by cells in the middle stratum of the sponge. Among cœlenterates various forms of skeleton, both external and internal, both limy and "horny," are represented by the different kinds of corals. With few exceptions these skeletons are produced by cells belonging to the outer layer or ectoderm of the animal. Worms have little that can be called a skeleton. The tubes, calcareous or otherwise, in which many sedentary worms are sheltered, have no vital connection with the animals which make and inhabit them. Echinoderms tend to be very calcareous; lime is deposited in the mesodermic tissue of the body in almost any part, though predominantly near the surface. Most arthropods have well-developed exoskeletons, cuticles formed from the epidermis, consisting in great part of an organic basis of chitin, on which, in crustaceans and most myriopods, carbonate of lime is also deposited. As this cuticle is not always restricted to the outside of the animal, but sometimes extends inward, an apparent endoskeleton arises—*e. g.*, in the lobster, the king crab, and the scorpion. Most mollusks have shells in which carbonate of lime occurs along with an organic basis conchiolin, and in cuttlefish there is a remarkable development of cartilage around the nerve centers in the head—an analogue of the skull in vertebrate animals.



SKELETON

1—Frontal bone
2—Parietal bone
3—Temporal bone
4—Occipital bone
5—Malar bone
6—Superior maxillary
7—Inferior maxillary
8—Cervical vertebræ
9—Nasal bone
10—Sternum
11—Humerus
12—Ulna
13—Radius
14—Lumbar vertebræ
15—Innominate bones
16—Sacrum
17—Head of femur
18—Shaft of femur
19—Patella
20—Shaft of tibia
21—Fibula
22—Greater trochanter of femur
23—Condyles of femur
24—Tuberosity of tibia
25—Clavicle
26—Condyles of humerus
27—Head of radius
28—Dorsal vertebræ
29—Scapula

Skeleton of Vertebrates.—Here we must distinguish first of all between the external exoskeleton and the internal endoskeleton. The scales of fishes, the scales and scutes of reptiles, the scales, claws, and even feathers of birds, the remarkable bony armature of armadillos, the scales of pangolins, the claws of carnivores, the quills of porcupines, and even the hair of ordinary mammals illustrate the variety of structures which may be included within the anatomical conception of an exoskeleton. All these structures are formed in the epidermis, or in the dermis, or in both combined. Tortoise shell and the scales of reptiles are epidermic; the scutes of crocodiles and the plates covering armadillos are dermic; the scales of elasmobranch and ganoid fishes are due to both layers. But it is difficult to carry out any rigidly logical classification.

The Skeleton of Man.—As the bones of all the chief parts of the human body are described in separate articles, we need not do more than unify these by reference to a diagram of the entire skeleton. Altogether there are more than 200 bones, but some which are originally distinct become fused with their neighbors.

In the vertebral column there are originally 33 vertebræ, but in adult life the normal number is 26, for, while the first 24 remain distinct, five (the 25th to the 29th inclusive) unite to form the sacrum supporting the hip girdle, and the four hindmost fuse more or less completely in a terminal tail piece or coccyx. Seven cervicals support the neck; 12 dorsals form the greater part of the back and bear ribs; five lumbars occur in the loins; these are followed by the sacrum and the coccyx.

The ribs, or elastic arches of bone which bound the breast, are normally 12 on each side. Most of them articulate dorsally with the bodies of two adjacent vertebræ and with the transverse processes of the posterior one; ventrally the first seven pairs are connected with the median breastbone by means of intervening cartilages, while the posterior five pairs are more or less free.

The skull consists in early adult life of 22 separate bones, but originally there were more, and as life continues the number may be further reduced by fusion. See SKULL.

The skeleton of the arm includes 30 bones—in the upper arm the humerus, which articulates with the shoulder girdle; in the forearm the radius and ulna, which articulate with the humerus at the elbow; the wrist of eight carpal bones; the five metacarpals of the palm; the five digits, of which the four fingers have each three joints or phalanges, while the thumb has two. The important bone of the pectoral girdle is the shoulder blade or scapula. To this, at the shoulder joint, there is fused a small beak-like bone—the coracoid—which is separate in birds and reptiles, but reduced to a mere process of the scapula in all mammals except the monotremes. Stretching from the breastbone to shoulder blade is the curved collar bone or clavicle.

SKELETON OF GIANT SLOTH

The skeleton of the leg also includes 30 bones—in the thigh the femur, which articulates with the hip girdle; in the lower leg the shin bone or tibia and the splint bone or fibula, which articulate with the femur at the knee joint, where there lies a little "sesamoid" bone—the patella; in the ankle region seven bones, then five metatarsal bones forming the sole of the foot, and five toes with the same number of phalanges as in the fingers. The pelvic girdle consists in early life of three paired bones—large dorsal ilium, a posterior ischium, an anterior pubis on each side—but these unite about the 25th year into a single haunch bone with the socket of which the thigh articulates.

SKELLIGS, THE, three rocky islets off the S. W. coast of Ireland, W. of Bolus Head, county Kerry. There are here two lighthouses, visible 18 miles.

SKELTON, JOHN, an English poet; born about 1460, probably in Norfolk. He studied at both Oxford and Cambridge, and from the former received the laureateship (then a degree in grammar). He was tutor to the Duke of York, afterward Henry VIII.; was rector of Diss and curate of Trompington in 1504, and was appointed *orator regius* to Henry VIII. His satirical attacks incurred the resentment of Wolsey, and Skelton had to take refuge in the sanctuary at Westminster, where the abbot afforded him protection till his death in 1529. His works comprise among others the drama or morality of "Magnyfycence"; a satire on Wolsey, entitled "Why Come Ye Not to Courte?"; the "Tunning (that is the brewing) of Elynour Rummyng," a humorous picture of low life; and the "Boke of Phyllyp Sparowe."

SKERRYVORE LIGHTHOUSE, a lighthouse built on a rock forming part of an extensive reef lying about 12 miles S. W. from the wild isle of Tyree on the W. coast of Scotland. Lying in the fairway of vessels making for the Clyde and Mersey, it was long the terror of mariners. The reef is exposed to the mighty "fetch" of the Atlantic.

SKI, large snow-shoes worn in Norway and other extreme N. countries. They are light in their construction and are about eight feet long. Without these it would be impossible for the peasants to get about during the months of deep snow, when ordinary walking is impossible. The ski has become popular in Canada and in some parts of the United States, especially in the northwestern states, where there is a large Scandinavian population. Here "ski running" has become a prominent feature of winter sport.

SKIN, that membrane of variable thickness which covers the whole body externally and extends inward into all the natural openings, where it changes its properties, becoming soft and moist, and hence known as mucous membrane. The skin is generally described as composed of three layers: the cuticle, the rete mucosum, and the cutis vera, the last being the most internal. The cutis (dermis), or true skin, consists of two layers, of which the deeper is called the corium, and the more superficial, the papillary layer. The corium is composed of numerous fibers closely interlaced, and forming a smooth surface for the support of the papillary layer. It varies in thickness, being, as a general rule, thick on the exposed parts and thin on the protected. The papillary layer is soft, and formed by numerous papillæ which cover its whole surface. It contains the expansions of the sensitive nerves. The rete mucosum (mucous network) lies immediately over the cutis, and in some measure diminishes the inequalities of its surface, being thicker between the papillæ and thinner on their summit. It is composed of minute, nucleated cells, and is almost pulpy in consistence. It is very slightly developed in the white races, but is very distinct and thick in those that are darker, the cells, which are filled with a pigment, being that which gives the dark color to their skin. The cuticle, scarfskin, or epidermis is a disorganized scaly substance, serving to protect from injury the more delicate cutis. It is thickest on the most exposed parts; and on the palms of the hands and soles of the feet it consists of several layers. The skin performs various important functions. It is the seat of common sensation, and is furnished with numerous pores or openings which give passage to the sweat and other exhalations. It is in this way the great regulator of the heat of the body.

The different diseases of the skin may be classified into eight orders, distinguished from each other solely by the appearances on the skin, as follows: (1) *Papulæ*, or pimples, little elevations of the cuticle of a red color, and not containing any fluid, as in the earliest stage of smallpox. (2) *Squamæ*, or scales, small, hard, thickened, opaque, whitish patches of unhealthy cuticle, as in leprosy. (3) *Exanthemata*, or rashes, superficial red patches varying in figure and size, and irregularly diffused over the surface, as in measles, scarlet fever, etc. (4) *Bullæ*, blebs or miniature blisters, as sometimes occur in erysipelas. (5) *Postulæ*, or pustules, circumscribed elevations of the cuticle containing pus, and having red inflamed bases, as in the eruption of smallpox when at its height and maturity. (6) *Vesiculæ*, or vesicles, small elevations of the cuticle, covering a fluid usually at first clear and colorless, but becoming afterward opaque and whitish, or pearly, as in cowpox and chickenpox. (7) *Tubercula*, tubercles, small, hard, superficial tumors, circumscribed and permanent, or, if they separate at all, it is only partially. (8) *Maculæ*, spots or patches, arising from excess or deficiency of the coloring matter of the skin, and frequently occurring congenitally, or connected with some slight disorder of the digestive organs or of the general health.

SKINNER, CHARLES RUFUS, an American educator, born at Union Square, N. Y., in 1844. He was educated at Mexico Academy and Clinton Liberal Institution and received honorary degrees from Hamilton, Colgate, and Tufts. From 1867 to 1870 he was engaged in business in New York City; from 1870 to 1874 he was manager and city editor of the "Daily Times," Watertown, N. Y.; from 1877 to 1881 a member of the New York Assembly; from 1881 to 1885 a member of congress; from 1886 to 1892 Deputy State (N. Y.) Superintendent of Public Instruction; from 1892 to 1894 supervisor of Teacher's Institute; from 1895 to 1904 State Superintendent of Public Instruction; from 1906 to 1911 assistant appraiser of the port of New York; and since 1915 Legislative Librarian at Albany, N. Y. He wrote: "New York Question Book" (1890); "Arbor Day Manual" (1891); "Manual of Patriotism for the Schools of New York" (1900); "The Bright Side" (1909).

SKINNER, OTIS, an American actor, born in Cambridge, Mass., in 1858. He was educated at Hartford, Conn., in which

OTIS SKINNER

city he first appeared as an amateur reader and actor. In 1877 he made his professional début in Philadelphia. He then appeared successively at Niblo's, New York; with Lawrence Barrett; with Augustin Daly; and with Mme. Modjeska. Since 1895 he has appeared as star in many romantic productions. The best known of his later productions were "Kismet" (1911-1914); "Cock O' the Walk" (1915-1916); "Mr. Antonio" (1916-1918); "The Honor of the Family" (1918-1919); "The Joy of Peter Barban" (1919-1920).

SKINNER, ROBERT P., an American consular officer, born in Massillon, Ohio, in 1866. He was educated in the public schools of Cincinnati, and from 1886 to 1897 he was owner and editor of the "Evening Independent," Massillon, Ohio. From 1897 to 1908 he was Consul at Marseilles, France; from 1908 to 1914, Consul General at Hamburg, and since July, 1914, Consul General at London, England. In 1903 he was appointed commissioner to establish relations and to negotiate a treaty between the United States and Ethiopia, and in 1912 he was commissioned to adjust the claims of foreign creditors against the republic of Liberia. He wrote "Abyssinia of Today" (1906).

SKOBELEFF, MIKHAIL DIMITRIEVICH, a Russian military officer; born in 1843; entered the army as sub-lieutenant in 1861. He distinguished himself against the Poles in 1866, and afterward in Central Asia. In 1876 he was appointed military governor of the province of Ferghana. In the Russo-Turkish War Skobeleff distinguished himself at the second battle of Plevna, and also at Loftscha. In 1878 he was created adjutant-general to the emperor. In 1880 he successfully led an expedition against the Tekke Turcomans, and captured Geok Tepe, Jan. 12, 1881. He was then promoted to the rank of general. He died suddenly in Moscow, July 7, 1882.

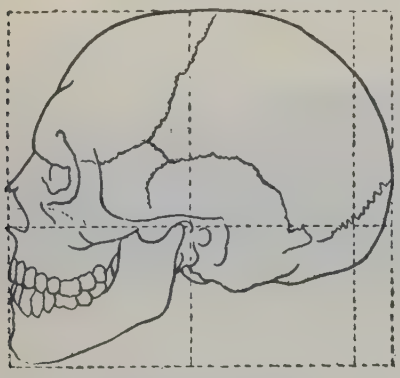
SKOPELOS, an island, one of the northern Sporades, in the Grecian Archipelago, about 11 miles long and 5 miles broad. The town of Skopelos, on its S. E. shore, is a Greek see and has a number of churches and convents.

SKOWHEGAN, a city of Maine, the county-seat of Somerset co. It is on the Kennebec river. Its manufactures include woolen and worsted goods, canned corn, foundry and machine shop products, etc. It is the center of an important dairying region. Its public buildings include a public library, a court house, and a hospital. Pop. (1910) 5,341; (1920) 5,981.

SKUA, in ornithology, the popular name of any species of the genus *Stercorarius*. They are predatory swimming birds, rarely fishing for themselves, and

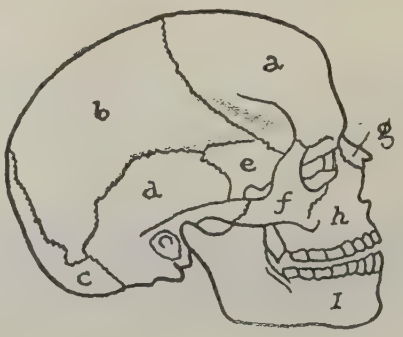
generally pursuing smaller gulls and terns, and compelling them to drop or disgorge their prey. Four species visit the temperate regions of Europe and America: *S. catarrhactes*, the great skua, which breeds in the Shetland Islands; it is about 24 inches long, and of somber plumage; *S. pomatorhinus*, the pomatorhine skua, 21 inches, dark mottled above, under surface brown (nearly white in old birds); *S. crepidatus*, the Arctic or Richardson's skua, about 20 inches long, occurring under two different plumages, one entirely sooty, the other with white under parts, and *S. parasiticus*, the long-tailed or Buffon's skua, about 14 inches long, upper part of head black, upper surface brownish-gray, under surface white.

SKULL. The skull is divided into two parts, the cranium and the face. In human anatomy it is customary to describe the former as consisting of eight and the latter 14 bones; the eight cranial bones, which constitute the brain case, being the occipital, two parietal, frontal, two temporal sphenoid and ethmoid; while



EUROPEAN SKULL

the 14 facial bones, which surround the cavities of the mouth and nose and complete the orbits or cavities for the eyes, are the two nasal, two superior maxillary, two lachrymal, two malar, two palate, two inferior turbinated, vomer, and inferior maxillary. The bones of the ear, the teeth, and the Wormian bones are not included in this enumeration. The lower jaw articulates with the temporal bones by means of a diarthrodia joint, but all the others are joined by sutures. On the base of the cranium the occipital and sphenoid bones articulate by means of a plate of cartilage (synchondrosis) in young subjects; in adults this becomes bony union. Sutures are named from the bones between which they are found, but to those around the parietal bones special names are given—*e. g.*, interparietal or sagittal; occipito-parietal or lambdoid; fronto-parietal or coronal; parieto-temporal or squamous. During adult life many of the sutures close by bony union and disappear, but

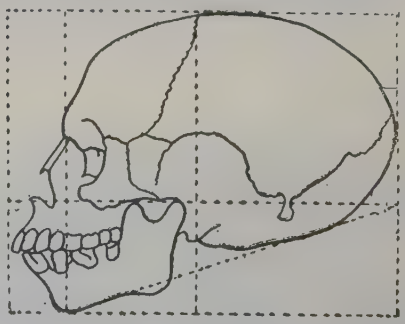


HUMAN SKULL

a—Frontal bone
b—Parietal bone
c—Occipital bone
d—Temporal bone
e—Sphenoid bone
f—Malar bone
g—Nasal bone
h—Upper jaw bone
i—Lower jaw bone

both the age at which this occurs and the order of its occurrence are subject to variation. Wormian bones are irregular ossifications found in relation to the sutures of cranial bones, but these bones are seldom seen in relation to the bones of the face.

The fact that concussion of the brain scarcely ever proves fatal, unless there



NEGRO SKULL

is also fracture of the skull, affords the most distinct evidence that the skull is constructed in such a manner that so long as it maintains its integrity it is able to protect its contents from serious lesion. There are two points in the architecture of the bones of the face which deserve special notice—viz. (1) the great strength of the nasal arch; and (2) the

immobility of the upper jaw, which is fixed by three buttresses—the nasal, the zygomatic, and the pterygoid.

SKUNK, the *Mephitis*, a genus of small carnivorous quadrupeds of the family *Mustelidæ*. The body is elongated,

SKUNK

and usually much arched; the tail long and thickly covered with long, fine hair; the head small, with thick, blunt snout; the legs short, and the paws comparatively large, with five incompletely divided toes. The general color is black and white. The power, characteristic in some degree of all the *Mustelidæ*, of forcibly discharging the fetid secretion of the anal glands is in the skunks enormously developed.

SKUNK RIVER, a river of Iowa whose source is in Hamilton co. Its course is S., crossing Jasper, Mohaska, Keokuk and Henry counties. It flows into the Mississippi about 11 miles below Burlington. The North Skunk, which rises in Marshall co., flows into the main river about 10 miles S. E. of Sigourney. The upper part is sometimes called the South Skunk. It is about 275 miles long.

SKYE, after Lewis, the largest of the Scotch islands, and the most N. of the Inner Hebrides, is included in Inverness-shire; area, 547 square miles. Separated from Ross-shire in the N. W. by the Sound of Rona, and from Inverness in the S. W. by the Sound of Sleat, it approaches within half a mile of the mainland between these two channels at Kyle Rhea. It is very irregular in shape, and is so cut up by inlets that no part of it is more than 4 miles from the sea. The chief inlets, all toward the W. and N., are Lochs Eishort, Slapin, Scavaig, Bracadale, Follart, and Snizort; the principal headlands are Aird Point, Ru-Huinish, Dunvegan Head, and Vaternish Point, which are extremities of the peninsulas of Duirinish, Vaternish, and Trotternish in the N., and Sleat Point in the S. Its extreme length from Aird Point to Sleat Point is 47 miles; its greatest breadth, from Portree to Copnahow Head, 22 miles. Skye is a wild, highland country, and its rocky mountains and pale headlands are shrouded in the mists of the Atlantic. The S. portion, however, is "comparatively soft and green," the long promontory of Sleat being the "best wooded, the sunniest, and the most carefully cultivated" part of Skye, with its larch plantations and trim hedgerows.

The inhabitants are mainly Celtic, and universally speak Gaelic, though the use of English is gradually increasing. There is a strong Norse infusion, and the names of the N. headlands are Norwegian, not Gaelic. The chief families in Skye are the Macdonalds of Sleat, who trace their descent to the Lords of the Isles, and the Macleods, originally Norsemen, who still occupy old Dunvegan Castle. The island is historically interesting as the home of Flora Macdonald and the refuge of Prince Charles. At the old house of Kingsburgh Flora entertained Dr. Johnson and Boswell in 1773. The grave of Flora in the churchyard of Kilmuir, was marked by the erection of an Iona cross, a granite monolith 28 feet high, in November, 1871. Pop. about 13,000.

SKYROS, or **SCYRO**, an island of the Grecian Archipelago; the largest of the northern Sporades; 24 miles N. E. of Eubœa; length, 17 miles, area, 79 square miles. Skyros is very mountainous in the S., the mountains being covered with forests of oaks, firs, and beeches; but the N. part, though also hilly, has several fertile plains, which produce fine wheat and grapes for wine. The only town is Skyro, or St. George on the E. coast. This island is associated with the legends of Achilles and Theseus. In 469 B. C., Cimon the Athenian conquered it and carried off to his native city the bones of the hero Theseus. It was likewise celebrated for its goats and its variegated marble. Pop. about 3,500.

SLADEN, DOUGLAS BROOKE WHEELTON, an English poet; born in London, Feb. 5, 1856. He wrote "Frithjof and Ingebjorg, and Other Poems" (1882); "Edward the Black Prince," an epic drama (1886); "Australian Ballads and Rhymes" (1888); "The Spanish Armada" (1888), a ballad; "Australian Poets" (1888); "A Japanese Marriage" (1895); "The Admiral" (1898); "A Sicilian Marriage" (1905); "Tragedy of

the Pyramids" (1909); "The Unholy Estate" (1912); "Germany's Great Lie" (1914); "Twenty Years of My Life" (1915); "Grace Lorraine" (1917); etc.

SLAG, in metallurgy, vitreous mineral matter removed in the reduction of metals; the scoria from a smelting furnace. It is used for making cement and artificial stone, in the manufacture of alum and crown glass, and is cast into slabs for pavements, garden rollers, etc. In founding, the fused sullage and dross which accompany the metal in a furnace, and which it is the business of the skimmer to hold back from the ingate. Also the scoria of a volcano.

SLATE, a very remarkable form of clay rock, frequently fossiliferous and not confined to one geological period. Consisting essentially of clay, the particles of slate are so mechanically arranged that the rock splits with perfect facility into almost indefinitely thin layers in one direction only, and in all others either breaks with a jagged edge, or in well-defined joints at some distance from each other. Mineralogically slate is nothing more than a pure clay; nor does there seem any reason to suppose that any approach is made in it toward crystalline structure. As, however, no other rock shows this tendency to split indefinitely, the case is one of great interest. Practically slate is very valuable, owing to its peculiar facility of splitting and the perfectly smooth natural face which it presents. Its hardness and compactness preserve it from all weathering by mere exposure, though, when ground down, it easily passes back into fine clay. Slate is always, and properly, regarded as a metamorphic rock. For a long time slate was used almost exclusively for roofing. For this purpose the slates are cut into sizes varying from a few square inches to two square feet, though some are much larger. This is done with very simple tools and extreme rapidity. The rest is in slabs or thick slates, often very large. The use of slate and slabs has increased considerably of late years. Slabs are now used in house fittings; as in strong rooms, powder magazines, larders, partitions, baths, stables, floors, etc. It is very largely used also for enameling; the surface of enameled slate being made to represent marble of all kinds with wonderful accuracy, and resisting almost all wear. Quarries of great magnitude are worked in Cornwall, Wales, Scotland, and Ireland. The product of the Welsh quarries was formerly largely exported to the United States, but this business received a serious check on the opening of valuable quarries in Vermont, New York, Pennsylvania, Maryland, and other states.

Adhesive slate is a kind of greenish-gray slate, quickly absorbent of water, and remarkable for its adhesiveness. Bituminous slate, a soft species of sectile slate clay impregnated with bitumen; hornblende slate, a slaty rock consisting of hornblende and feldspar with some chlorite, principally used for flagging pavements, etc.

SLATIN PASHA (Baron Rudolf Carl), an Austrian soldier, born near Vienna, in 1857. After service in the Austrian Army, he engaged in service in Egypt under General Gordon, and in 1881 was made Governor-General of Darfur. Shortly after, the Mahdi aroused his followers and began the famous religious war which resulted in 1884 in the defeat of Hicks Pasha, and the capture of Slatin by the Mahdists. He was made practically a slave of the Mahdist commander, Abdullahi, who succeeded the Mahdi after the latter's death. He was kept in captivity for 11 years, until 1895, when he succeeded in escaping to Lower Egypt. He was made a pasha by the Khedive, and was appointed in 1900 British Inspector-General of the Sudan. In 1906 he was created a Baron of the Austrian empire. He had already been made an honorary major-general in the British army, but in 1914 renounced this and other British honors.

SLATTERY, CHARLES LEWIS, an American Protestant Episcopal clergyman, born in Pittsburgh, Pa., in 1867. He was educated at Harvard and the Episcopal Theological School, Cambridge, Mass. He was made a deacon in 1894, and a priest in 1895. From 1894 to 1896 he was rector of St. Andrew's, Ayer, Mass., and a master at Groton School; from 1896 to 1907 dean of the Cathedral at Faribault, Minn.; from 1907 to 1910 rector of Christ Church, Springfield, Mass., and since May, 1910, rector of Grace Church, New York City. He was at various times a lecturer at Seabury Divinity School, Faribault, Minn., and at Berkeley Divinity School, as well as paddock lecturer at the General Theological Seminary (1911-1912); and West lecturer at Stanford University (1915). He wrote: "Felix Reville Brunot" (1901); "Edward Lincoln Atkinson" (1904); "The Master of the World—a Study of Christ" (1906); "Life Beyond Life—a Study of Immortality" (1907); "The Historic Ministry and the Present Christ" (1908); "Present-Day Preaching" (1909); "Alexander Viets Griswold Allen" (1911); "The Authority of Religious Experience" (1912); "The Light Within" (1915);

"Why Men Pray" (1916); "The Gift of Immortality" (1916); "A Churchman's Reading" (1917); "Certain American Faces—Sketches from Life" (1918); "The Lord's Prayer" (1919).

SLAVE COAST, a maritime strip on the W. of Africa, on the Guinea coast, extending between the Volta and Akinga, a stretch of about 240 miles. It consists mainly of long narrow islands. The principal towns on the coast are Badagry and Whydah. A large traffic in slaves was formerly carried on at the ports of this region, hence its name.

SLAVERY, the state or condition of a slave, bondage. Slavery in the full sense of the term implies that the slave is the property or at the disposal of another, who has a right to employ or treat him as he pleases; but the system has been subjected to innumerable limitations and modifications. Slavery probably arose at an early period of the world's history out of the accident of capture in war. Savages, in place of massacring their captives, found it more profitable to keep them in servitude. All the ancient Oriental nations of whom we have any records, including the Jews, had their slaves. The Hebrews were authorized by their law to possess slaves, not only of other races, but of their own nation. The latter were generally insolvent debtors who had sold themselves through poverty, or thieves who lacked the means of making restitution; and the law dealt with them far more leniently than with stranger slaves. They might be redeemed, and if not redeemed became free in the space of seven years from the beginning of their servitude; besides which there was every 50th year a general emancipation of native slaves.

Serfdom.—A numerous class of the population of Europe known as serfs or villeins were in a state of what was almost tantamount to slavery during the early Middle Ages. In some cases this serf population consisted of an earlier race which had been subjugated by the conquerors; but there were also instances of persons from famine or other pressing cause, selling themselves into slavery, or even surrendering themselves to churches and monasteries for the sake of the benefits to be derived from the prayers of their masters. Different as was the condition of the serf in different countries and at different periods, his position was on the whole much more favorable than that of the slave under the Roman law. He had certain acknowledged rights—and this was more particularly the case with the classes of serfs who were attached to the soil. In England, prior to the Norman Conquest, a large proportion of the population were in a servile position, either as domestic slaves or as cultivators of the land. The humblest was nearly a slave—the *theow;* the other, the *ceorl,* an irremovable tiller of the ground.

In Scotland as in England serfdom disappeared by insensible degrees; but a remarkable form of it continued to survive down to the closing years of the 18th century. Colliers and salters were bound by the law, independent of paction, on entering to a coal work or salt mine, to perpetual service there; and in case of sale or alienation of the ground on which the works were situated, the right to their services passed without any express grant to the purchaser. The sons of the collier and salter could follow no occupation but that of their father.

Negro Slavery.—This form existed from the earliest times; the Carthaginians seem to have brought caravans of slaves from various parts of north Africa; but in this the negroes suffered no more than other contemporary barbarians. The negro slavery of modern times was a sequel to the discovery of America.

The first part of the New World in which negroes were extensively used was Haiti, in St. Domingo. The aboriginal population had at first been employed in the mines; but this sort of labor was found so fatal to their constitution that Las Casas, Bishop of Chiapa, the celebrated protector of the Indians, interceded with Charles for the substitution of African slaves as a stronger race. As early as the beginning of the 16th century a good many Africans were already in Hispaniola; the emperor accordingly in 1517 authorized a large importation of negroes from the establishments of the Portuguese on the coast of Guinea. Sir John Hawkins was the first Englishman who engaged in the traffic, in which his countrymen soon largely participated, England having exported no fewer than 300,000 slaves from Africa between the years 1680 and 1700; and between 1700 and 1786 imported 610,000 into Jamaica alone. Most of the English slaving ships belonged first to Bristol, and from 1730 onward to Liverpool.

The slave trade was attended with extreme inhumanity. Legal restraints were, however, imposed in the various European settlements to protect the slaves from injury; in the British colonies courts were instituted to hear their complaints; their condition was to a certain extent ameliorated, and the flogging of women was prohibited. But while slavery was thus legalized in the British colonies, it was at the same time the law of England (as decided in 1772 by Lord Mansfield in the case of the negro Somerset)

that as soon as a slave set his foot on English soil he became free; though, if he returned to his master's country, he could be reclaimed.

In 1787 a society for the suppression of the slave trade was formed in London, numbering Thomas Clarkson and Granville Sharp among its original members. The most active parliamentary leader in the cause was William Wilberforce, and Zachary Macauley was one of its most zealous friends. The Quakers were the only religious body who as such petitioned the House of Commons on the subject.

The United States abolished the slave trade immediately after Great Britain (1808), and the same was in the course of time done by the South American republics of Venezuela, Chile and Argentina, by Sweden, Denmark, Holland, and, during the Hundred Days after Napoleon's return from Elba, by France. Great Britain, at the peace, exerted her influence to induce other foreign powers to adopt a similar policy; and eventually nearly all the states of Europe have passed laws or entered into treaties prohibiting the traffic. The accession of Portugal and Spain to the principle of abolition was obtained by treaties of date 1815 and 1817; and by a convention concluded with Brazil in 1826 it was declared piratical for the subjects of that country to be engaged in the slave trade after 1830. By the conventions with France of 1831 and 1833, to which nearly all the maritime powers of Europe have since acceded, a mutual right of search was stipulated within certain seas, for the purpose of suppressing this traffic. The provisions of these treaties were further extended in 1841 by the Quintuple Treaty between the five great European powers, subsequently ratified by all of them except France. The Ashburton treaty of 1842 with the United States provided for the maintenance by each country of a squadron on the African coast; and in 1845 a joint co-operation of the naval forces of England and France was substituted for the mutual right of search.

The steps that hindered or prepared the way for the final abolition of slavery in the United States in 1861-1865 are part of the history of the country. Here it may be noted that in 1800 there were in the United States 893,041 slaves; that Vermont, Pennsylvania, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey emancipated their slaves before 1840, most of them by gradual measures. The average value of slaves was about this period stated at $600. The 3,953,760 slaves at the census of 1860 were in what were known as the Southern States. Eminent leaders of public opinion from the earliest period of the national existence—such as Washington, Franklin, Jefferson, Madison, Jay, Hamilton—regarded slavery as a great evil and inconsistent with the principles of the Declaration of Independence. The Society of Friends uniformly opposed slavery and agitated against it. The Presbyterian Church made six formal declarations against it between 1787 and 1836.

Mohammedanism recognizes the institution; Mohammed's own precepts insist on the kindly usage of the slave; and Moslem slavery is mainly domestic slavery, household slaves being on the whole well treated. But there is no more awful chapter in the history of human callousness and human misery than the story of the slave trade as carried on by "Arab" or Moslem slave traders. The main regions from which slaves were procured for the Moslem East were, or still are, the Sudan proper, the Egyptian Sudan, or Valley of the Upper Nile, Somaliland, and the borders of the Portuguese East African territory. English and other men-of-war were long employed in capturing slave dhows on the E. coast. In 1869 the Egyptian Khedive Ismail gave Sir Samuel Baker large powers for the suppression of the slave trade, a crusade carried on by Gordon Pasha. The Sultan of Zanzibar signed a treaty for the suppression of the trade in 1873.

By occupying Caucasia, Russia stopped an important supply for the Turkish harems; it also closed the slave markets of Khiva and Bokhara, and by crushing the Turkomans (Tekkes and others) freed at once 40,000 slaves. Cardinal Lavigerie, who became Archbishop of Algiers in 1867, made the suppression of the slave trade and slavery his life work, and secured the help of many zealous fellow workers, men and women. In 1890 an international conference including Turkey, Persia, Zanzibar and the United States formulated an act for the purpose of repressing the slave trade. Slavery, except among semi-barbarous peoples, is now non-existent.

SLAVS, a division of the Aryan or Indo-Germano family, inhabiting eastern and central Europe. They number about 176,000,000. Included in the group (eastern division) are Great and Little Russians, or Malo-Russians (Ukrainians and Ruthenians) and White Russians; (western division): Slovenes and Serbo-Croats, Slavic inhabitants of Macedonia and Bulgaria. The Slavs before the great migration of nations inhabited the territory between the Oder and Dneiper rivers and between the 3rd or 4th century and the

7th century migrated toward the Baltic Sea, the Danube and the Balkan peninsula. The Germans in the 10th century forced out the Slavs from many regions, which then became German. The Bulgarians, a Turkish people who had invaded the Balkan peninsula, were absorbed by the Slavic occupants of the territory. The Slavic states are described under their several headings. See SLAVONIA, UKRAINE, JUGO-SLAVIA, and CZECHO-SLOVAKIA. Also BALKAN PENINSULA; BALKAN WARS.

SLAVONIA, or **SCLAVONIA**, formerly a province of Austro-Hungary, forming, with Croatia, a kingdom united with that of Hungary, now a province of JUGO-SLAVIA (*q. v.*), bounded N. and E. by Hungary, W. by Croatia, and S. by Turkey; area, of Croatia and Slavonia, 16,423 square miles; pop. about 2,650,000. Principal towns, Eszék (the capital), Peterwardin, Carlovitz, Semlin, Mitrovitz, and Brod.

SLEEP, that natural state or condition of unconsciousness in animals which alternates with a period of activity. In this state the involuntary functions, such as those of nutrition, secretion, etc., go on as usual, but the voluntary powers are quiescent.

SLEEPING SICKNESS, Sleeping Dropsy, Negro Lethargy. A term applied to several distinct diseases. The first is a tropical disease caused by a parasite, *Trypanosome gambiense*, carried by a tsetse fly *Glossina palpalis*. This discovery was made in 1903. It is now considered possible that rat fleas play a part in its dissemination, and mosquitoes and other species of fly have also been suspected. The cause of the symptoms appears to be an inflammation of the lymphatics produced by the presence of the trypanosome. This inflammation finally injures the brain, spinal cord, and their membranes, and leads to the so-called cerebral stage of the disease, which gave it the name sleeping sickness. Probably within two or three weeks after the bite of an infected fly the victim develops a fever, often accompanied by an eruption. The fever is intermittent or remittent. There may be neuralgic pains and the lymphatic glands are enlarged. During this stage the disease may be cured. Later, sometimes after weeks or months of fever, the victim gradually loses his brightness, has difficulty in walking, is dull and apathetic, and develops a sort of palsy. Epileptiform fits may occur. Emaciation and muscular weakness gradually increase, the saliva dribbles from the mouth, the intelligence wanes, and coma appears with a subnormal temperature, and the patient dies. This sleeping stage lasts from a few weeks to several months.

The only drug that has proved of any value is arsenic. This has been administered in various forms. Another disease of the same name appears at intervals in the United States and Europe. Its technical name is lethargic encephalitis, or inflammation of the brain. While there is a close relation in the symptoms to infantile paralysis, the two diseases probably have no connection. No definite remedy has been discovered for this malady. The best known preparation is called *atoxyl*.

SLEZAK, LEO, an Austrian singer, born at Mährisch-Schönberg, in 1876. He early developed musical talent and when only 17 years of age made his first appearance as "Lohengrin." He sang in Berlin in 1898 with great success, and for seven years succeeding was a member of the Vienna Opera. In 1908 he began studying with Jean de Reszke, and in the following year made a remarkable success at Covent Garden, London. This was followed by his engagement, lasting a number of years, at the Metropolitan Opera House in New York. He was especially excellent in the Wagner operas and in many of the Italian operas.

SLIDELL, JOHN, an American statesman; born in New York City, about 1793; was graduated at Columbia University in 1810; studied law, and in 1819 went to New Orleans, where he soon acquired a large practice. He was appointed United States district attorney for Louisiana in 1829; elected to Congress in 1843; made minister to Mexico in 1845; and was in the United States Senate in 1853-1861. In September, 1861, he was appointed a Confederate commissioner to France, and in November set out with his associate, James M. Mason, for Southampton. Both commissioners were seized on the English mail steamer "Trent" by Capt. Charles Wilkes of the United States steamer "San Jacinto," and brought to the United States. After imprisonment in Fort Warren he was released on the demand of Great Britain, and sailed for England in January, 1862. From England he at once went to Paris, where in February, 1862, he paid his first visit to the French minister of Foreign Affairs. His mission, which had for its object the recognition of the Confederate States by France, was a failure, but he succeeded in negotiating a large loan and in securing the ship "Stonewall" for the Confederate government. After the war he settled in London, England, where he died July 29, 1871.

SLIGO, a maritime county of Ireland. It is in Connaught and has an area of 707 square miles. The coast has numerous inlets and a splendid bay. Near the border is situated Roth Crauachan, celebrated as the court of Queen Maeve, the great opponent of Cuchulain, and with the site of a famous mediæval school in the vicinity. Cattle raising, fisheries, and agriculture are the chief industries. Pop. about 75,000.

SLOAN, JOHN, an American painter, born at Lock Haven, Pa., in 1871. He was educated at the Philadelphia Central High School and at the Pennsylvania Academy of Fine Arts. He was especially well known for his paintings and etchings of city life subjects, as well as for his drawings published in many of the most prominent magazines. He received a medal for etchings at the Panama-Pacific Exposition. He was an instructor at the Art Student's League and a director of the Society of Independent Artists.

JOHN SLOAN

SLOANE, WILLIAM MILLIGAN, an American historian; born in Richmond, O., Nov. 12, 1850; was graduated at Columbia in 1868; studied in Berlin and Leipsic (1872-1876), and during part of that time was private secretary of George Bancroft, then minister at Berlin. He was for several years a professor at Princeton, later Professor of History at Columbia. He published: "The French War and the Revolution," "Life of James McCosh," in 1897 brought out a very important "Life of Napoleon," in four volumes. His later works include: "The French Revolution and Religious Reform" (1901); "The Balkans" (1914); "Party Government in America" (1915).

SLOCUM, HENRY WARNER, an American military officer; born in Delphi, Onondaga co., N. Y., Sept. 24, 1827. He was graduated at the United States Military Academy in 1852; resigned his commission in 1856; studied law, and practiced in Syracuse, N. Y. He was elected a member of the State Legislature in 1859. When the Civil War broke out he was commissioned a colonel of volunteers in the Union army. He was at the first battle of Bull Run, commanding a regiment, July 21, 1861; was promoted Brigadier-General in the autumn of 1861, and commanded a division in the battles of Gaines's Mill, White Oak Swamp, and Malvern Hill. In 1862 he was promoted Major-General; participated in the battles of Bull Run, Aug. 29 and 30; commanded a corps at the battle of Chancellorsville, and at Gettysburg, July 2 and 3, 1863, was placed in command of a corps on the left wing of General Sherman's army; and took part in the great "March to the Sea," leading the left wing of the army from Atlanta to Savannah. In September, 1865, he resigned from the army; settled in Brooklyn; and resumed the practice of law. He was elected to Congress in 1869 and served till 1873. He died in Brooklyn, N. Y., April 14, 1894.

SLOSSON, EDWIN EMERY, an American editor and writer, born at Albany, Kan., in 1865. He graduated from the University of Kansas in 1890, and took post-graduate studies at the University of Chicago. He was for several years professor of chemistry at the University of Wyoming. In 1903 he became literary manager of the "Independent," and from 1912 was an associate professor at the Columbia School of Journalism. He wrote "Great American Universities" (1910); "Major Prophets of To-Day" (1914); "Creative Chemistry" (1919); "The American Spirit in Education" (1919).

SLOVAKS, the name of the Slavic inhabitants of North Hungary who in the 9th century formed the nucleus of the great Moravian kingdom, but who, after the bloody battle of Presburg (A. D. 907), were gradually subjugated by the Magyars. There are scattered settlements of Slovaks in Austria and Slavonia. They number about 2,500,000. The Slovaks,

whose character probably comes nearest to that of the old Slavic type, travel in great numbers over Germany and Poland as peddlers. Their language is a dialect of the Bohemian. See CZECHO-SLOVAKIA.

SMALL, ALBION WOODBURY, an American educator, born at Buchfield, Me., in 1854. He was educated at Colby College, the Newton Theological Institution, the Universities of Berlin and Leipzig, and Johns Hopkins University. From 1881 to 1888 he was professor of history and political economy at Colby College, and from 1889 to 1892 president of this institution. From 1892 to 1905 he was professor and head of the department of sociology at the University of Chicago, and since 1905 Dean of the Graduate School of Arts and Literature. Beginning with 1895 he was editor of the "American Journal of Sociology." He wrote "General Sociology" (1905); "Adam Smith and Modern Sociology" (1907); "The Cameralists" (1909); "The Meaning of Social Science" (1910); "Between Eras" (1913).

SMALLEY, GEORGE WASHBURN, an American journalist; born in Franklin, Mass., June 2, 1833. During the American Civil War, the war between Prussia and Austria, and the Franco-German War, he distinguished himself as war correspondent of the New York "Tribune," and as representative of the same in London (1867-1895) he gained an eminent rank in journalism. His "London Letters and Some Others" and "Studies of Men" were widely popular. He published two series of "Anglo-American Memories" (1911-1912). He became American correspondent of the London "Times" in 1895. He died in 1916.

SMALLPOX, an eruptive febrile disease, which happily is not now nearly so prevalent as it once was. According to some Arabic historians, it came first from Ethiopia into Arabia about A. D. 572. The wars which were carried on in the East, and particularly the Crusades in the 12th and 13th centuries, introduced it into Europe, first into Spain and France, and then into other countries. This disease commonly commences with the usual febrile symptoms; as rigors, pain in the back and loins, great prostration of strength, followed by heat and dryness of the skin, a hard and frequent pulse, loss of appetite, pain in the epigastrium, with nausea, vomiting, headache, and sometimes delirium or convulsions. About the third day an eruption of small, hard, red-colored pimples makes its appearance about the face and neck, and gradually extends over the trunk and extremities. The pimples gradually ripen into pustules, which, on the eighth day, generally begin to break, and crusts or scabs form on these last, falling off in four or five days more. When the pustules are numerous they run together and form an irregular outline; when fewer they are distinct and of a regularly circumscribed circular form. The former is technically called *variola confluens,* and the other *variola discreta;* the former being never free from danger, the latter seldom or never dangerous.

SMART, CHRISTOPHER, an English poet, and one of the interesting figures of literary history; born in Shipbourne, Kent, England, April 11, 1722. His fame rests on a "Song to David" (1763). Noted also is a version of Horace which had a wide sale. Other works are: "Poems" (1752); "Power of the Supreme Being" (1753); "The Hilliah: An Epic Poem" (1753); "Poems on Several Occasions" (1763); "Translation of the Psalms of David" (1765); and many miscellaneous essays, poems and translations. He died in London, May 21, 1771.

SMELT, *Osmerus eperlanus;* a small anadromous fish; common on the coasts and in the fresh waters of northern and central Europe, and of corresponding American latitudes, from August to May, returning to the sea after it has deposited its eggs. It sometimes becomes landlocked in lakes. New Zealand smelt, *Retropinna richardsoni,* one of the *Salmonidæ,* found only in the rivers of New Zealand.

SMELTING, the act or process of obtaining metal from ore by the combined action of heat, air, and fluxes. The operation varies according to the different metallic ores to be operated on. In smelting iron the ore is first roasted in a kiln in order to drive off the water, sulphur, and arsenic with which it is more or less combined in its native state, and is then subjected to the heat of a blast-furnace along with certain proportions of coke or coal and limestone, varying according to the quality and composition of the ore to be heated. The smelting of copper consists in alternate roastings and fusions. The first of these operations is calcining the ore in furnaces in which the heat is applied and increased gradually till the temperature is as high as the ore can support without melting or agglutinating, when the ore is thrown into an arch formed under the sole of the furnace. The second operation, or fusion of the calcined ore, is performed in a luted furnace, the ore having been spread uniformly over the hearth, and fluxes, such as lime, sand, or fluorspar, being added when required, though the necessity for this addition is sought to be obviated by

a careful admixture of ores of different qualities, the several earthy components of which serve as fluxes in the fusion of the mass. These two processes of calcination and fusion are repeated alternately till the ore is completely freed from all the earthy materials, and pure metal is obtained. In smelting lead, the ores, after being sorted, cleansed, ground, and washed, are roasted in furnaces which are without any blast or blowing apparatus, the ores being separable from the metal by its great fusibility. The smelting of tin consists of the calcining or roasting of the ores after they have been cleaned, sorted, stamped, and washed. See BLAST FURNACE; IRON AND STEEL.

SMELTING FURNACE, a furnace for disengaging the metal from its gangue or the non-metalliferous portions of the ore. The furnaces differ much, according to the metals to be treated. See BLAST FURNACE: REVERBERATORY FURNACE.

SMEW, in ornithology, the *Mergus albellus*, called also the smee or nun, frequenting the seashore and also inland ponds and lakes of Europe and America. The adult male is about 17 inches long; head, chin and neck white, a black patch round the eyes, and over the back of the head is a green streak forming, with some white elongated feathers, a kind of crest; back black, tail gray, wings black and white, under surface white, penciled with gray on the flanks. The female is smaller, with plumage chiefly reddish-brown and gray.

SMILACEÆ, sarsaparilla; an order of dictyogens. Herbs or under-shrubs often climbing, and with fleshy tuberous rhizomes; leaves reticulated; fruit, a roundish berry. Known genera, two; species 120, widely distributed, but most numerous in Asia and America.

SMILAX, sarsaparilla, the typical genus of the order *Smilaceæ*. The roots of several species or varieties constitute the sarsaparilla of the Materia Medica. Sarsaparilla is regarded as an alterative in venereal and skin diseases, rheumatism, etc. The kind most valued is that known as Jamaica sarsaparilla, obtained from the species *S. officinalis*. It is not the produce of Jamaica, but of Central America and the N. parts of South America. Other kinds distinguished in commerce are Lima, Lean Vera Cruz, Gouty Vera Cruz, Lisbon, or Brazilian, and Honduras. Among the European species is *S. aspera*, the roots of which form Italian sarsaparilla.

SMILES, SAMUEL, a British miscellaneous writer; born in Haddington, Scotland, Dec. 23, 1812; was educated at Edinburgh University, and as a surgeon in Edinburgh; editor of Leeds "Times"; secretary of the Leeds and Thirsk railway; afterward of Southeastern railway; then retired. Many of his writings had a very wide circulation. Among them are: "Self-Help" (1859); "Life of George Stephenson" (6th ed. 1864); "Lives of Engineers" (1862; new ed. 1874, 5 vols.); "The Huguenots in England and Ireland" (4th ed. 1876); "Thrift" (1875); "Men of Invention and Industry" (1884); "Life and Labor," "Conduct," etc. The King of Servia conferred on him (1897), for his literary work, the Knight Commander's Cross of the Royal Order of St. Sava. He died April 16, 1904.

SMILEY, ALBERT KEITH, an American humanitarian, born at Vassalboro, Me., in 1828. He graduated from Haverford College in 1849, and was an instructor in that institution until 1853. In 1853 he founded, together with his brother, the English and Classical Academy in Philadelphia. For a number of years following he was principal of schools in Philadelphia and at Providence, R. I. His chief work, however, was the establishment of the Lake Mohonk Conference, at Mohonk Lake, where annual meetings for the discussion of humanitarian and social subjects are held. In 1889 he purchased a large tract of land at Redlands, Cal., part of which he made into a park. He died in 1912.

SMILLIE, ROBERT, a British labor leader, born in Scotland in 1859. He was educated in the board schools and at first worked as a miner. Rising as an official of his trade union, he became in 1894 president of the Scottish Miners' Federation, and later president of the Miners' Federation of Great Britain. He was one of the most strenuous fighters in behalf of the movement for the nationalization of mines.

SMITH, ADAM, a Scotch political economist; born in Kirkcaldy, Fifeshire, Scotland, June 5, 1723. He studied at Oxford, and was appointed Professor of Moral Philosophy at Glasgow University in 1752. Toward the close of 1763 he accepted an invitation to travel with the Duke of Buccleuch, and having resigned his chair, made a long tour in France, becoming acquainted at Paris with some of the most eminent philosophers and economists. Returning in 1766, he spent the next 10 years in retirement at Kirkcaldy, engaged in the composition of his great work, the "Inquiry into the Nature and Causes of the Wealth of Nations" (1776). It has a high rank among the successful books of the world. Its main principle is that labor, not money or land,

is the real source of wealth. The means of making labor most fruitful, the division of labor, what wealth consists in, the mischiefs of legislative interference with industry and commerce, the necessity of freedom of trade, are admirably discussed and expounded. The book may be regarded as the basis of modern political economy. In 1778 Smith settled in Edinburgh, where he had the appointment of a commissioner of customs for Scotland. He was the friend of David Hume, of whose last days and death he wrote an account, with a warm panegyric on his character, which was published with Hume's autobiography. He was also author of a "Theory of Moral Sentiments" (1759). Smith was chosen lord-rector of the University of Glasgow in 1787. He died in Edinburgh, July 17, 1790.

SMITH, ALFRED EMANUEL, an American public official, born in New York City in 1873. He was educated in the parochial schools and received honorary degrees from Manhattan College and Fordham University. From 1895 to 1903 he was a clerk in the office of the commissioner of jurors; from 1903 to 1915 a member of the New York Assembly, becoming the Democratic leader in 1911 and speaker in 1913; in 1915 a delegate to the State Constitutional Convention; from 1915 to 1917 sheriff of New York co.; and from 1917 to 1919 president of the Board of Aldermen of Greater New York. Always having been a member of Tammany Hall, he was the Democratic candidate for governor in 1918 and was elected in the fall of that year for a two-year term. Although his administration was, generally speaking, efficient and satisfactory to the people of the State, he failed of reelection in 1920, being defeated by the Republican candidate, Nathan L. Miller. His popularity was indicated by the fact that he received almost 500,000 more votes than the Democratic candidate for President and that he ran ahead of the balance of the Democratic ticket by an almost equal number of votes. On his retirement from public service on Jan. 1, 1921, he became vice-president and general manager of a large trucking concern in New York City.

SMITH, ALFRED H., an American railway official. He entered the service of the L. S. and M. S. Ry. at Cleveland as a messenger boy in 1879, rising gradually to the position of general superintendent in 1901. In 1902 he became connected with the N. Y. C. and H. R. RR. as general superintendent, becoming general manager in 1903, vice-president in 1906, senior vice-president in 1913, and president of the N. Y. Central Lines in 1914. During the World War he was assistant director-general of railroads in charge of transportation in the trunk line territory E. of Chicago and N. of the Ohio and Potomac rivers, and later regional director of the eastern district. At the end of his service with the Federal Government he was re-elected president of the N. Y. Central Lines on June 1, 1919.

SMITH, C(HARLES) ALPHONSO, an American educator and writer, born at Greensboro, N. C., in 1864. He was educated at Davidson College and at Johns Hopkins University, holding also honorary degrees from the University of Tennessee, University of North Carolina, and the University of Cincinnati. From 1890 to 1893 he was instructor of English at Johns Hopkins University; from 1893 to 1902 professor of English language and literature at the Louisiana State University; from 1902 to 1907 professor of English language; from 1907 to 1909 head of the English Department and dean of the graduate department at the University of North Carolina; from 1909 to 1917 Edgar Allan Poe Professor of English at the University of Virginia; and from 1917 on head of the Department of English at the United States Naval Academy. At various times he was a lecturer on English language and literature at the University of California, University of Kansas, etc. From 1910 to 1911 he was Roosevelt professor of American history and institutions at the University of Berlin. He was the founder of the Virginia Folk Lore Society (1913). Besides contributing to periodicals, he was associate editor of "World's Orators" (1901), and of the "Library of Southern Literature," and wrote: "Repetition and Parallelism in English Verse" (1894); "Old English Grammar and Exercise Book" (1896); "Elementary English Grammar" (1903); "Studies in English Syntax" (1906); "Die Amerikanische Literatur" (1911); "Selections from Huxley" (1911); "The American Short Story" (1912); "Pericles" (1913); "What Can Literature Do for Me?" (1913); "O. Henry, Biography" (1916); "Short Stories Old and New" (1916); "Keynote Studies in Keynote Books of the Bible" (1919); "New Words Self-Defined" (1919).

SMITH, CHARLES EMORY, an American journalist; born in Mansfield, Conn., Feb. 18, 1824; was graduated at Union College in 1861; edited the Albany "Express" in 1865-1870, and in 1880 became editor of the Philadelphia "Press." He was United States minister to Russia in 1890-1892; a delegate to several National Republican conventions; and postmaster-general, 1898-1901, then resuming the editorship of the Philadelphia "Press." He died Jan. 19, 1908.

SMITH, CHARLES HENRY, pseudonym, "Bill Arp," an American humorist; born in Lawrenceville, Ga., June 15, 1826; was graduated at Franklin College, Athens, Ga., in 1848; studied law and practiced in Rome, Ga., for 27 years, afterward removing to Cartersville; served in the Confederate army in 1861-1865, becoming major on staff of 3d Georgia Brigade. His literary career began (1861) in a series of letters under his pseudonym. His publications include: "Bill Arp's Scrap Book" (1886); "The Farm and the Fireside," and "Georgia as a Colony and State, 1733-1893." Died 1903.

SMITH, CHARLES SPENCER, an American bishop of the African Methodist Episcopal Church, born at Colborne, Canada, in 1852. He was educated in the public schools of Canada and at Meharry Medical College, Nashville, Tenn., from which institution he received the degree of M.D. in 1880. He also holds honorary degrees from Wilberforce University and Victoria College. He was ordained a minister of the A. M. E. Church in 1872; was a member of the Alabama House of Representatives from 1874 to 1876; founded in 1882 the Sunday School Union of the A. M. E. Church, of which he was secretary and treasurer from 1882 to 1900; and was elected bishop in 1900, becoming later presiding bishop of the A. M. E. Church in Michigan, Canada, and the West Indies. He wrote "Glimpses of Africa, West and South West Coast" (1895).

SMITH, DANIEL APPLETON WHITE, an American missionary, born at Waterville, Me., in 1840. He was educated at Harvard University and the Newton Theological Institution. After having been ordained a Baptist minister in 1862, he devoted himself to missionary work, becoming president of the Karen Theological Seminary at Insein, Burma, in 1876. He served until 1916, when he became president emeritus, and was also editor of the "Morning Star," a Karen monthly. He wrote "Sketch of the Life of E. A. Stevens" (1886); "Sound Principles of Interpretation" (1902); "Sermonizing and Preaching" (1904); and various Bible annotations and commentaries in the Karen language.

SMITH, EDGAR FAHS, an American chemist and educator, born in York, Pa., in 1856. He graduated from Pennsylvania College in 1874 and took post-graduate studies in Germany. For several years he served as instructor at the University of Pennsylvania and as professor at Muhlenberg and Wittenberg colleges. From 1888 to 1911 he was professor of chemistry at the University of Pennsylvania. He was appointed vice-provost of the University in 1899, and provost in 1911, retiring in 1920. He was president of the American Chemical Society, and was a member of other scientific societies. He wrote many books on chemical subjects, including "Theories of Chemistry" (1913); "Chemistry in America" (1914); "Chemistry in Old Philadelphia" (1918), and "James Cutbush" (1919).

SMITH, ELLISON DU RANT, American Senator; born at Lynchburg, S. C., Aug. 1, 1866. In 1896 he was elected to the South Carolina Legislature. He took an active part in the organization of the Farmers' Protective Association in 1901, and was delegate to the Boll Weevil Convention at Shreveport, La., in 1905. He was elected to the United States Senate by the Democrats for the three terms from 1909 to 1927.

SMITH, FRANCIS HOPKINSON, an American painter, writer and civil engineer; born in Baltimore, Md., Oct. 23, 1838. He was educated as a mechanical engineer; built the government wall round Governor's Island, one at Tompkinsville, S. I., the Race Rock lighthouse off New London, Conn., the foundation for the statue of Liberty Enlightening the World in New York harbor, etc. He won fame as a water-color artist and an illustrator, and lectured on art. Among his most popular books are: "Book of the Tile Club" (1890); "A White Umbrella in Mexico" (1889); "Colonel Carter of Cartersville" (1891); "American Illustrators" (1892); "A Gentleman Vagabond" (1895); "Gondola Days" (1897); "Caleb West" (1898); "The Other Fellow" (1899); "Kennedy Square" (1911); "The Arm Chair at the Inn" (1912); "In Dickens Land" (1914); "Felix O'Day" (1915). He died in 1915.

SMITH, FREDERICK EDWIN, Baron Birkenhead, British Lord Chancellor, born at Birkenhead, England, in 1872. He was educated at Birkenhead School and Wadham College, Oxford, and was president of the Oxford Union Society in 1893. He was conservative candidate for the Scotland Division of Liverpool in 1903-4 and for the Walton Division in 1905. He was an associate of Sir Edward Carson in the opposition to Irish Home Rule, threatening to take the field, but became Solicitor-General when the European War broke out. He became Lord Chancellor in 1919. He wrote "International Law," "My American Visit."

SMITH, FREDERICK MADISON, president of the Reorganized Church of Jesus Christ of Latter Day Saints, born

at Plano, Ill., in 1874. He was educated at the University of Iowa, Graceland College, University of Missouri, and University of Kansas, and holds the degree of Ph.D. from Clark University. After teaching mathematics at Graceland College, Lamoni, Ia., and being editor of a local paper, he became in 1902 first counselor of the Reorganized Church of Jesus Christ of Latter Day Saints and president in 1915. From 1908 to 1912 he was editor of the "Journal of History" and in 1917 he became editor of the "Saints' Herald." He was a member of many historical and scientific societies.

SMITH, GEORGE, an English Assyriologist; born in London, England, March 26, 1840. The importance of his contributions to our knowledge of Assyrian history and inscriptions is everywhere acknowledged. Part of his published works are: "The Chaldean Account of Genesis"; "Assyria from the Earliest Times Till the Fall of Nineveh" (1875); "Assyrian Discoveries" (1875), an account of his own travels and researches; "The Assyrian Eponym Canon" (1875); "History of Babylonia," edited by A. H. Sayce (1877); "History of Sennacherib," edited by A. H. Sayce (1878). He died in Aleppo, Aug. 19, 1876.

SMITH, SIR GEORGE ADAM, a British educator, born at Calcutta, in 1856. He was educated at the Royal High School, University, and New College, Edinburgh, and at Tübingen and Leipzig. After traveling in Egypt and Syria he became assistant to the Rev. John Fraser, at Brechin, and then became Hebrew tutor at Aberdeen. He traveled again in Syria and east of the Jordan, and went back to England to teach and write. His works include: "The Book of Isaiah," "The Preaching of the Old Testament to the Age," "Historical Geography of the Holy Land," "The Twelve Prophets," "The Life of Henry Drummond," "Modern Criticism and the Preaching of the Old Testament," "Syria and the Holy Land."

SMITH, GEORGE OTIS, an American geologist and public official, born at Hodgdon, Me., in 1871. He graduated from Colby College in 1893, and took post-graduate studies at Johns Hopkins University. For many years he was engaged in geological work in various States of the Union, and from 1896 to 1907 was assistant geologist and geologist of the United States Geological Survey. He was director of the Survey from 1907. He was a member of many scientific societies and was the author of many papers on the economics of minerals and power resources.

SMITH, GERRIT, an American philanthropist; born in Utica, N. Y., March 6, 1797; was graduated at Hamilton College in 1818; studied law; and took up his residence at Peterboro, Madison co., N. Y., devoting himself to the care of a vast landed estate in Central and Northern New York left him by his father. He joined and liberally contributed to the American Colonization Society in 1825, but withdrew from it in 1835, then becoming a member of the Anti-Slavery Society. He gave pecuniary aid to John Brown, in whose affair at Harper's Ferry, he, however, it is thought, had no part. He was nominated for governor of New York in 1840 and in 1858; was a member of Congress in 1853-1854, but resigned after one session; with Horace Greeley he signed the bail bond of Jefferson Davis in 1867. He was an earnest advocate of temperance and a supporter of a number of reforms. He built a non-sectarian church at Peterboro, in which he occasionally preached. He published "Speeches in Congress" (1855); "Sermons and Speeches" (1861); "The Religion of Reason" (1864); "The Theologies" (1866); and "Nature the Base of a Free Theology" (1867). He died in New York City, Dec. 28, 1874.

SMITH, GOLDWIN, an English historian; born in Reading, England, Aug. 13, 1823; was educated at Eton and Oxford, where he graduated first-class in classics in 1845 and became a fellow of University College in 1847. He also held the post of Regius Professor of History in the university from 1858 to 1868. As a lecturer he attracted great attention both on account of his strongly democratic views and his striking originality. Having during the American Civil War strongly defended the cause of the North, he was at the close of the war invited to visit the States to deliver a course of lectures, and his visit resulted in his becoming Professor of History at Cornell University, New York. He resigned the appointment in 1871, and was appointed member of the senate of the University of Toronto, where he afterward resided. Among his chief works are: "Lectures on Modern History" (1866); "The Empire," a series of letters (1863); "Speeches and Letters on the Rebellion" (1865); "Three English Statesmen" (Pym, Cromwell, and Pitt) (1867); "A Short History of England Down to the Reformation" (1869); "A History of the United States" (1893); "Essays on Questions of the Day" (1894); "Guesses at the Riddle of Existence" (1896); "The United States: an Outline of Political History" (1899); "My Memory of Gladstone" (1905); "No Refuge but in Truth" (1909). He died June 7, 1910.

SMITH, HARLAN INGERSOLL, an American scientist, born at East Saginaw, Mich., 1872. He was educated in the public schools and at the University of Michigan. In 1891 he was an assistant at the Peabody Museum, Harvard University. From 1891 to 1893 he was in charge of the anthropological collections in the Museum of the University of Michigan. He became in 1895 connected with the American Museum of Natural History, with which institution he served chiefly in connection with its department of archæology, becoming honorary curator of archæology in 1912. He was archæologist of the Jesup Northern Pacific Expedition and of the Geological Survey of Canada. His archæological explorations, undertaken since 1897, were devoted chiefly to British Columbia, and to other parts of Canada. He was a member of several domestic and foreign anthropological societies and wrote: "Archæology of Lytton" (1899); "Archæology of the Thompson River Religion" (1900); "Cairns of British Columbia and Washington" (1901); "Shell Heaps of the Lower Fraser River, British Columbia" (1903); "Archæology of the Gulf of Georgia and Puget Sound" (1907); "Archæology of the Yakima Valley, Washington" (1910); "The Prehistoric Ethnology of a Kentucky Site" (1910).

SMITH, HENRY LOUIS, an American educator, born at Greensboro, N. C., in 1859. He was educated at Davidson College and the University of Virginia. From 1887 to 1901 he was professor of physics, and from 1901 to 1912 president of Davidson College. In 1912 he became president of Washington and Lee University. He was a lecturer on educational and scientific topics and a member of several educational and other societies.

SMITH, HOKE, a United States Senator from Georgia, born at Newton, N. C., in 1855. He was privately educated and removed with his parents to Georgia in 1872. In the following year he was admitted to the bar, and practiced at Atlanta until 1909, except while serving as Secretary of the Interior in the cabinet of President Cleveland, from 1893 to 1896. He was governor of Georgia from 1907 to 1909, and was re-elected for the term 1911 to 1913. He resigned as governor to enter the United States Senate, having been elected to fill the unexpired term of Alexander S. Clay, deceased. He was reelected for the term of 1915 to 1921, but was defeated by Thomas E. Watson in 1920.

SMITH, HERBERT KNOX, an American lawyer, born at Chester, Mass., in 1869. He was educated at Yale University. He practiced law at Hartford, Conn., from 1895 to 1903 and again beginning with 1912. From 1900 to 1902 he was a member of the Hartford Common Council; from 1903 to 1905 a member of the Connecticut House of Repre-

HERBERT KNOX SMITH

sentatives; from 1903 to 1907 deputy commissioner of corporations, Department of Commerce and Labor; and from 1907 to 1912 commissioner of corporations. In 1912 he was progressive candidate for governor of Connecticut. During the World War he served as a major in the Q. M. C.

SMITH, JAMES and **HORACE,** authors of the "Rejected Addresses" and other excellent humorous compositions; born in London, James, Feb. 10, 1775; Horace, Dec. 31, 1779. The managers of the new Drury Lane Theater, completed in 1812 to replace the burned one, offered a prize for the most suitable opening address; the result was a deluge of such ludicrous rubbish that all had to be rejected, and Byron was commissioned to write one. The brothers Smith conceived the idea of burlesquing the style of leading poets and other men of letters and

public notorieties, in a set of pieces purporting to be among the real addresses sent in to the committee but declined. Hence the volume of "Rejected Addresses," which by 1819 had reached its 16th edition, and is a livingly familiar classic still. Its travesties are hardly caricatures so much as genuine reproductions of the spirit as well as manner of their subjects. Horace subsequently published many novels and poems, the best-known among them being the "Ode to an Egyptian Mummy." James was afterward a well-known diner-out, entertainer, and contributor to periodical literature in his day; his best-known pieces are "The Taking of Sebastopol" and "Surnames Go by Contraries." James died Dec. 26, 1839; Horace, July 12, 1849.

SMITH, J(AMES) ALLEN, an American educator, born at Pleasant Hill, Mo., in 1860. He was educated at the Universities of Missouri and Michigan. From 1895 to 1897 he was professor of economics and sociology at Marietta College, Ohio. In 1897 he became professor of political science at the University of Washington, serving also as dean of the graduate school since 1909. He wrote: "Multiple Money Standard" (1896); "The Spirit of American Government" (1907).

SMITH, JAMES FRANCIS, an American jurist, born in San Francisco, Cal., in 1859. He was educated in Santa Clara College and at Hastings Law School and was admitted to the bar in 1881. In April, 1898, he became colonel of the First California Regiment, U. S. V. With it he saw service in the Philippines from June, 1898, until June, 1901. Besides participating in many engagements he served as military governor of the Island of Negros and as collector of customs of the Philippine Archipelago. He was mentioned in dispatches for gallantry and was promoted Brigadier-General, U. S. V., in 1899. In 1901 he was associate justice of the Supreme Court of the Philippines; from 1903 to 1906 he was a member of the Philippine Commission and secretary of public instruction for the Philippine Islands; from 1906 to 1909 governor-general of the Philippine Islands; and since 1910 associate justice of the United States Court of Customs Appeals.

SMITH, JESSIE WILCOX, an American artist, born in Philadelphia. She was educated privately and studied art at the Pennsylvania Academy of Fine Arts, and at Drexel Institute. From 1890 she was engaged as an artist and illustrator. She was especially known for her skill in portraits of children. She contributed to most of the important magazines, and illustrated many books.

SMITH, JOHN, an English adventurer, the founder of Virginia; born in Willoughby, in Lincolnshire, England, in January, 1579. Of a daring spirit, longing for a larger and more adventurous life, he early served in the Netherlands as a soldier in the cause of liberty. He then traveled in France, visited Egypt and Italy, and, about 1602, greatly distinguished himself in the wars of Hungary against the Turks, gaining the favor of Sigismund Bathori, Prince of Transylvania. Wounded and taken prisoner by the Turks, he was sold as a slave, was harshly treated in the Crimea, and made his escape. Rumors of war in Morocco attracted him thither, and thence he returned to England about 1606.

Smith entered with enthusiasm into the project of colonizing the New World, and with Gosnold, Wingfield, Hunt, and others set out in December, 1606, with a squadron of three small vessels for Virginia, under the authority of a charter granted by James I. Amid the unhappy dissensions, difficulties, and distress of the first years of the great enterprise, Smith rendered the most important services by his irrepressible hopefulness, practical wisdom, and vigorous government. But for his wisdom and noble exertions the project would probably have been abandoned. He made important geographical explorations and discoveries. In 1607, ascending the Chickahominy, and penetrating into the interior of the country, Smith and his comrades were captured by the Indians, and he only, by his rare self-possession, escaped with life. He remained a prisoner for some weeks, carefully observed the country, got some knowledge of the language of the natives, and when at last they were going to put him to death he was saved by the affectionate pleading of Pocahontas, the daughter of the chief, Powhatan, a girl 10 or 12 years old. Reconducted to Jamestown, Smith had need of all his energy to cheer the desponding colonists. In the summer of 1608 he explored in an open boat the Bay of Chesapeake and its tributary rivers, a navigation of nearly 3,000 miles. He also penetrated inland, established friendly relations with the Indians, and prepared a map of the country. On his return from this great expedition he was made president of the colonial council. In 1609 he was severely injured by an accidental explosion of gunpowder, and without reward for his splendid services, except in his own conscience and the applause of the world, returned to England. He visited Virginia in 1614, was captured by the French in the following year, and on his return to London after three months heard of the arrival of his Indian friend Pocahontas. Smith made known her serv-

ices, and she was presented to Queen Elizabeth and loaded with marks of honor and gratitude. Smith published in 1608 "A True Relation of Such Occurrences and Accidents of Note as Hath Happened in Virginia Since the First Planting of That Colony." He died in London, June 21, 1631.

SMITH, JOHN WALTER, American Senator; born at Snow Hill, Md., Feb. 5, 1845. In 1889 he was elected to the State Senate, and in 1895 acted as chairman of the Democratic State Committee. In 1899 he became a member of Congress; in 1900 was elected Governor of Maryland, serving two terms. In 1908 he was elected to the United States Senate for the term ending in 1909 and was re-elected for terms 1909-1915 and 1915-1921.

SMITH, JOSEPH, the founder of the Mormons; born in Sharon, Windsor co., Vt., Dec. 23, 1805. He was revered as a prophet by his followers. His parents were poor farmers who went to Palmyra, N. Y., in the hope of bettering their condition, taking Joseph with them, about 1815. Later the family removed to Manchester in the same State. According to his own story regarding his earlier years, he worked hard on his father's farm. But the "oldest settlers" reported that the family had an aversion to hard toil of any kind and seemed inclined to lead thriftless lives, spending much time in digging for possible hidden treasure. About 1820 Joseph claimed to be a constant witness of supernatural visions and to be gifted with a supernatural sight. He pretended that he received in 1828 a divine revelation inscribed in mysterious hieroglyphics on golden plates which were delivered to him by an angel, and that the "Book of Mormon," which he published in 1830, was translated from those golden plates. The translation was dictated by him while he sat behind a curtain as if in the society of mysterious spiritual companions. He gathered a number of converts, and as "prophet" went with them first to Kirtland, O., and afterward to Independence, Mo. See MORMONS.

SMITH, JOSEPH FIELDING, a Mormon apostle; born in Far West, Mo., Nov. 13, 1838; drove an ox-team in the "exodus" of 1846; worked as a manual laborer in 1848-1854, and was a missionary to the Sandwich Islands in 1854-1857. He was ordained to one of the "seventies" in 1858 and to apostleship in 1866, becoming a member of the Council of 12 in 1867. He was several times a member of the Utah Legislature, and in 1882 presided over the Constitutional Convention which framed the constitution for the State of Utah; was director of Zion's Co-operative Mercantile Institution and several other enterprises; and editor of the "Improvement Era." He succeeded Lorenzo Snow as president of the Mormon Church in October, 1901. He died in 1918.

SMITH (EDMUND) MUNROE, an American educator, born at Brooklyn, N. Y., in 1854. He was educated at Amherst College, Columbia University, and at the University of Göttingen. He received honorary degrees from Columbia, Amherst and the University of Louisiana. From 1880 to 1883 he was instructor and from 1883 to 1891 adjunct professor of history at Columbia University, becoming professor of Roman Law and Comparative Jurisprudence in the latter year. Beginning with 1901 he was also a lecturer on Roman Law at the Georgetown Law School, Washington, D. C. He was an editor of the "Political Science Quarterly" and wrote: "Bismarck and German Unity" (1898); "Militarism and Statecraft" (1918).

SMITH, NORA ARCHIBALD, an American author, born in Philadelphia, Pa. She was educated at Santa Barbara College, California, and for some years devoted herself to kindergarten work in connection with her sister, Kate Douglas Wiggin, afterward engaging in literary work. She wrote "The Children of the Future" (1898); "Under the Cactus Flag" (1899); "The Kindergarten in a Nutshell" (1899); "The Message of Froebel" (1900); "Three Little Marys" (1902); "Nelson, the Adventurer" (1906); "The Adventures of a Doll" (1907); "The "Doll's Calendar" (1909); "The Home-Made Kindergarten" (1912); "Old, Old Tales from the Old, Old Book" (1916); "Plays and Pantomimes for Children" (1917). Also (with Kate Douglas Wiggin) "The Story Hour" (1891); "Children's Rights" (1893); "Republic of Childhood" (3 volumes); "Froebel's Gifts" (1896); "Froebel's Occupations" (1896); "Kindergarten Principles and Practice" (1897); "Golden Numbers" (1902); "The Posy Ring" (1903); "The Fairy Ring" (1906); "Pinafore Palace" (1907); "Magic Casements" (1907); "Tales of Laughter" (1908); "Tales of Wonder" (1909); "The Talking Beasts" (1911).

SMITH, SAMUEL FRANCIS, an American clergyman and religious poet; born in Boston, Mass., Oct. 21, 1808. He was the author of numerous hymns, including "America," which was written in 1832; and published for young readers and others: "Knights and Sea Kings," "Mythology and Early Greek History," and "Poor Boys Who Became Great." He died in Boston, Nov. 16, 1895.

SMITH, SYDNEY, an English clergyman; born in Woodford, Essex, England,

June 3, 1771. Educated at Winchester School, Sydney, in 1789, entered New College, Oxford, where he took his degree of M.A. in 1796, becoming fellow a few years afterward. In 1797 he obtained the curacy of Netheravon, a village on Salisbury Plain, where he passed a secluded life for about two years. He then went to Edinburgh as tutor to a young gentleman, continued there for five years, and was one of the founders in 1802 of the "Edinburgh Review," being also one of its most influential contributors. In 1804 he removed to London, about the same time married, and became renowned as one of the wittiest and most genial of men. In 1806 he was presented to the living of Foston-le-Clay, in Yorkshire. In 1807 appeared anonymously his celebrated "Letters of Peter Plymley," intended to further the cause of Catholic emancipation. His liberal views on politics excluded him for a long time from church preferment; but in 1828 he was presented to the rectory of Combe Florey, in Somersetshire, and in 1831, during the ministry of Earl Grey, he became one of the canons of St. Paul's, London, where he henceforth resided. A few years before his death a collected edition of his writings was published under his own supervision, including papers contributed to the "Edinburgh Review," "Sketches of Moral Philosophy," etc. He wrote a "Life of Dalton," and "History of the Atomic Theory up to his Time"; "Air and Rain: the Beginnings of a Chemical Climatology"; "Loch Etive, and the Sons of Uisnach"; "Science in Early Manchester"; etc. He died in London, Feb. 22, 1845.

SMITH, WILLIAM, the "father of English geology"; born in Churchill, Oxfordshire, England, March 23, 1769. Acting successively as land surveyor, mining surveyor, and canal engineer, he was led to indulge in many speculations of a geological nature. He became convinced that each stratum contained its own peculiar fossils, and might be discriminated by them, and in 1815 he was able to submit a complete colored map of the strata of England and Wales to the Society of Arts, and received the premium of $250 which had for several years been offered for such a map. His fame as an original discoverer was now secure; but becoming involved in pecuniary difficulties he was obliged to part with his geological collection to government for $3,500. Subsequently a pension was granted to him by government. He died in Northampton, England, Aug. 28, 1839.

SMITH, WILLIAM ALDEN, American Senator; born at Dowagiac, Mich., May 12, 1859. In 1879 he was appointed page in the Michigan House of Representatives, studied law, was admitted to the bar, and began practising in Grand Rapids in 1883. He was a member of the Republican State Committee in 1888. In 1895 he was elected to Congress, where he served for twelve years, and in 1907 to the Senate on the death of Russell A. Alger. He was reelected for the term 1913-1919, but declined a renomination in 1918.

SMITH, WILLIAM AUSTIN, an American clergyman of the Protestant Episcopal Church. He was educated at Harvard University and at Seabury Divinity School. He was made deacon in 1898 and priest in 1899. After serving as curate and rector of churches in Providence, R. I.; Milwaukee, Wis., and Springfield, Mass., he became editor of the "Churchman" in 1916.

SMITH, WINCHELL, an American playwright, born at Hartford, Conn., in 1871. He was educated in the public schools of Hartford, and from 1892 to

WINCHELL SMITH

1904 was on the stage. Together with Arnold Daly he produced a number of plays by George Bernard Shaw. He began the writing of plays in 1906. Among his best known plays were a dramatiza-

tion of "Brewster's Millions"; "The Fortune Hunter"; "The Boomerang" (with Victor Mapes); "Lightnin'" (with Frank Bacon); etc.

SMITH COLLEGE, an educational non-sectarian institution for women in Northampton, Mass.; founded in 1875; reported at the close of 1919: Professors and instructors, 123; students, 2,103; president, W. A. Neilson, LL.D.

SMITH-DORRIEN, SIR HORACE LOCKWOOD, a British general, born in 1858. He was educated at Harrow and entered the Sherwood Foresters (Derby regiment) in 1876. He served in the Zulu War in 1879, the Egyptian War in 1882, the Soudan campaign in 1885, in the Tirah campaign in India in 1897-8, and in the South African War in 1900 was major-general commanding a brigade and a division. He was also active in the World War in 1914-15, after having held the Southern Command in England during the two previous years. In 1914-15 he commanded the 2nd Army Corps and then the 2nd army in the British Expeditionary Force. In 1915-16 he commanded the British forces fighting the Germans in East Africa.

SMITH'S ISLAND, a small island of North Carolina, off the coast of New Hanover co., and at the mouth of Cape Fear river; 20 miles S. of Wilmington. Its most S. point is Cape Fear. It has a lighthouse.

SMITHSON, JAMES, an English philanthropist; natural son of Hugh Percy, 1st Duke of Northumberland; born in England about 1765; was graduated at Oxford in 1786, and elected a member of the Royal Society in 1787. His first paper presented to the society in 1791 was "An Account of Some Chemical Experiments on Tabasheer," and was followed from time to time by others treating of the chemical analysis of minerals, etc. In 1835 his property, amounting to $508,318, came into the possession of the United States Government, having been bequeathed by him "for the purpose of founding an institution at Washington, D. C., to be called the Smithsonian Institution for the increase and diffusion of knowledge among men." He died in Genoa, Italy, June 27, 1829.

SMITHSONIAN INSTITUTION, a literary, scientific, and philosophical institution, organized at Washington, D. C., by Act of Congress in 1846, pursuant to the will of James Smithson. The management of the institution is in the hands of regents appointed by the United States Government, and a spacious structure, containing a museum, library, cabinets of natural history, and lecture rooms, has been the result of their able administration of the testator's wishes. The library, carefully collected, is unsurpassed in the United States as a resource for scientific reference, while in its museum are collected the rich acquisitions of national exploring expeditions. Some part of its income is devoted to scientific researches, and the production of works too costly for publication by private individuals. Departments of astronomy, ethnology, meteorology, and terrestrial magnetism, have been established. The United States Weather Bureau has grown out of its department of meteorology, and the United States Fish Commission was established in connection with its work in ichthyology. Under its direction are the United States National Museum; the Bureau of International Exchanges; the Bureau of American Ethnology; the Astro-Physical Observatory; the National Zoölogical Park, Langley Aërodynamical Laboratory, Research Laboratory, International Catalogue and American History Archives. Among the publications hitherto issued are the "Smithsonian Contributions to Knowledge," 4to, distributed gratis to libraries; "Annual Reports"; "Miscellaneous Collections"; "Reports of the National Museum" (1884-1892); "Bulletins of the National Museum"; "Proceedings of the National Museum"; "Annual Reports of the Bureau of Ethnology"; and "Harriman Alaska Series." The periodical courses of lectures held in the institution by eminent scientists and savants form a prominent social feature of the national capital. The institution has had four secretaries: Joseph Henry (1846-1878); Spencer Fullerton Baird (1878-1887); Samuel Pierpont Langley (1887-1906); and Charles D. Walcott (1906———).

SMITH SOUND, a passage of water leading to the Arctic regions, at the N. extremity of Baffin Bay, between Prudhoe, in Greenland, and Ellesmere Land. Its S. entrance was discovered by Baffin in 1616. In 1854 it was surveyed by a United States expedition under Dr. Elisha Kent Kane. A gulf 110 miles long was found at its N. E. end.

SMOKELESS POWDER. See GUNPOWDER: EXPLOSIVES.

SMOKE NUISANCE. Smoke is caused by the incomplete combustion of fuel. It consists of finely divided particles, either of carbon or of hydrocarbons, the latter being, as a rule, liquid and oily. Under ideal conditions, there will be sufficient oxygen present to burn the carbon completely to oxides of carbon and also to decompose the hydrocarbons. It follows that with the right conditions of draught and temperature, no smoke will be pro-

duced, and with a good type of furnace under the control of a skilled and intelligent fireman, it is possible to burn even soft coal with the production of no more than a negligible quantity of smoke. Soft coal is more liable to produce smoke than hard coal because it contains a much larger proportion of volatile hydrocarbons, and for this reason its use in many cities is prohibited. Since smoke consists of unburned fuel, it follows that its elimination would be a saving to the coal consumer, provided the cost of elimination did not exceed the value of the coal. In spite of this, however, the smoke nuisance has become serious in cities in all parts of the world, and in most cases special legislation has been needed to combat it.

SMOKY HILL RIVER, or **SMOKY HILL FORK**, a river whose source is in eastern Colorado, and which flows into the State of Kansas. It traverses Gove, Trego, Ellis, Russell and Ellsworth counties, and 10 miles W. of Abilene unites with the Solomon river, the two streams forming the Kansas river. On both banks are extensive fertile prairies. It is 400 miles long.

SMOKY MOUNTAINS, or **GREAT SMOKY MOUNTAINS**, a range on the boundary of North Carolina and Tennessee; is a part of the Appalachian system. Mount Guyot, 6,636 feet high, and Clingman's Peak, 6,660 feet high, are among its loftiest summits.

SMOLENSK, a town of Russia in Europe, capital of a government of the same name, on the Dnieper, 230 miles S. W. of Moscow. It is the see of an archbishop, and has three cathedrals, numerous other churches, monasteries, and an episcopal palace. It has, besides, numerous schools, a college, hospitals, a house of correction, and assembly rooms. Manufactures, linens, leather, carpets, and soap. Smolensk was the scene of an obstinate conflict between the French and Russians, Aug. 16-17, 1812, in which victory is claimed on both sides. The day following, Aug. 18, the French returning to the attack, found the city deserted and in ruins. Pop. about 76,000.

SMOLENSK, a government of Russia. It is hilly in the N., and level in the S., and has an area of 21,624 square miles. It is watered by the Dnieper and Düna and several tributaries of the Volga and the Oka. Forests cover one-third of the soil. Manufacturing industries are developing and there is also considerable stock-raising. Oil, textiles, and lumber are among the chief products. The government was a mediæval principality and is mentioned in 1054. Tartars took possession of it and Lithuania held it in the 15th century. It was united to Russia in 1654. The capital is Smolensk. Pop. about 2,250,000.

SMOLLETT, TOBIAS GEORGE, an English novelist, born in March, 1721, the son of Archibald Smollett, of Dalquhurn, Dumbartonshire, Scotland, and his wife, Barbara Cunningham. He was educated in Dumbarton and at Glasgow University, where he studied medicine. After some years of an apprenticeship with a Dr. John Gordon, he went to London, where he sought to find patronage for a tragedy he had written. Failing in this, he shipped as surgeon on H.M.S. Cumberland, and served in the operations against Carthagena. He accompanied the fleet to Jamaica, where he met Nancy Lascelles, a creole beauty, whom he married in England about 1747. Leaving the navy, he settled as a surgeon in Westminster, and became a favorite of the taverns and coffee-houses on account of his talent for story-telling. But he made little of his practice, and, turning to literature, he published in 1758 "Roderick Random," a picaresque novel, modeled on "Gil Blas" and including a good deal of autobiography. It was well received, and its profits enabled him to publish his youthful tragedy, "The Regicide." His second novel, "The Adventures of Peregrine Pickle," appeared in 1751, and was even more successful, though it was disfigured by many coarse attacks on his personal enemies, and had an unsympathetic hero.

He now made another unsuccessful attempt to establish himself as a physician, this time at Bath, but gained little save material for future satire, especially on the medical profession. With his return to London in 1753, he gave himself up to literature, and produced "Ferdinand Count Fathom," which shows an increase in power. He spent extravagantly, and in the effort to get money made a lively but inaccurate version of "Don Quixote" (1755). After a visit to Scotland he became the chief director of the new "Critical Review" (1756), the severity of which brought a number of reprisals on his head; and in 1757, he published a "History of England" in four volumes. After a period of hack work for the booksellers, in the course of which he served three months in prison for slandering an admiral in the "Critical Review," he joined the staff of the new "British Magazine" (1760) in which appeared "Sir Launcelot Greaves," a weak imitation of "Don Quixote." Two years later he became editor of the "Briton," a weekly periodical started in defence of Lord Bute, which evoked Wilkes's notorious "North Briton."

In 1763, Smollett, having lost his only child, ill, in debt and harassed by enemies,

decided to leave England with his wife, and for two years made his home at Nice. After a tour of Italy he returned to London and published his "Travels." A visit to Scotland, where he was made much of in the then brilliant society of Edinburgh, and to Bath, improved his health for a time, and he produced in 1769 his coarse satire, "The History and Adventures of an Atom," dealing with politics in England during the previous fifteen years. At the end of the year he went to seek health at Lucca and Pisa, where he wrote his masterpiece, "Humphrey Clinker." Meantime he was growing weaker, and on Sept. 17, 1771, he died in his villa near Leghorn.

SMOOT, REED, a United States Senator from Utah, born in Salt Lake City, in 1862. After graduating from Brigham Young Academy in 1879, he engaged in business and became a director and officer in many important financial organizations in Salt Lake City and elsewhere. In 1900 he was appointed one of the apostles of the Mormon Church. He was elected to the United States Senate in 1902, 1908, 1916, and 1920. He was also a member of the Republican National Committee, and in 1919 was chairman of the Republican Senatorial Campaign Committee. In the Senate he was recognized as one of its most industrious and efficient members, and was an especial authority on matters pertaining to finance and the tariff.

SMUGGLING, originally and strictly a crime of commerce, a violation of customs laws, to be distinguished from such a crime of manufacture as illicit distillation, which violates excise laws. But the term is commonly applied also to the evasive manufacture and disposal of commodities liable to excise as well as to the clandestine importation of articles on which customs duties have been imposed. Defrauding the government of revenue by the evasion of customs duties or excise taxes may therefore serve as a definition.

Smuggling, in the sense of evading customs duties by dealing in contraband goods, has ceased to deserve the name of a trade in the United Kingdom. From about the close of the 17th century to nearly the middle of the 19th century the suppression of that kind of free trade by vigorous methods of prevention engaged the close attention of the inland revenue department. Free trade as a national policy has put down the smuggling trade. Only a very small number of persons comparatively deal in contraband goods now. But when the duties on spirits were higher in England than in Scotland, Northumberland and Cumberland were haunted with smugglers. Haddington and Berwick and the Scotch counties on the Solway were long demoralized by unwise tariffs on articles of import from abroad.

The contrabandista used to be one of the most popular characters in Spain. The exports from England to Gibraltar, to refer only to one of his lines of activity, used to be large, and were introduced by smugglers to the interior of Spain. The injudicious tariffs which used to be imposed by both England and France encouraged smuggling to an enormous extent on both sides of the English Channel; spirits, especially brandy, tea, tobacco, silk goods from France; from England the most important article of illicit trade was cotton twist. English goods were introduced into France chiefly by the Belgian frontier, and dogs were trained to convey them; a dog would convey goods worth from $100 to $250. A great historical outburst of smuggling was the answer which commercial enterprise gave to Napoleon's Berlin and Milan decrees. Silk from Italy reached England by Smyrna after being a year on passage, by Archangel after being two years. Cotton twist, coffee, sugar, tobacco, were shipped from England to Salonica, conveyed thence by mules and horses through Servia and Hungary to Vienna, and distributed over the Continent from that capital. Coffee from London would reach Calais by Vienna.

SMUTS, JAN CHRISTIAN, a South African soldier and statesman, born in

GENERAL JAN CHRISTIAN SMUTS

1870. He was educated at Victoria College, South Africa, and at Christ College,

Cambridge. He practiced law for a time in Cape Town and Johannesburg, and in 1898 was appointed State Attorney of the South African Republic. He was one of the chief leaders in the Boer War, and, following its close, he took a leading part in the work of reconstruction and union. He was Colonial Secretary of Transvaal in 1907. At the outbreak of the World War he commanded the forces invading German Southwest Africa and carried the operations to a complete success. He also defeated the German forces in German East Africa in 1916. In the following year he represented South Africa in the Imperial War Cabinet. He was one of the leading figures at the Peace Conference in Paris. He became Prime Minister of the UNION OF SOUTH AFRICA (*q. v.*) upon the death of General Botha in August, 1919.

SMYRNA (Turkish, Izmer), an ancient city and seaport of Asiatic Turkey, on the W. coast of Asia Minor, at the head of the gulf of the same name. The

COIN OF SMYRNA

appearance of the city from the sea is extremely attractive, but a closer inspection dissipates the illusion. The houses, mostly built of wood, are mean and fragile-looking; the streets close and filthy and filled with intolerable stenches proceeding from the sewers and drains. The city is divided into four quarters—Frank, Turk, Jew, and Armenian. There is an English hospital, church, and burying-ground, English schools, and numerous schools for Turks, Greeks, and others; all sects and faiths having complete toleration, Smyrna has been for centuries the most important place of trade in Asia Minor. The chief imports are cotton manufactures, woolen cloths, colonial goods, iron, steel, and hardware goods. The principal exports are dried fruits (especially figs), cotton, silk, goats' hair, sheep and camels' wool, rugs, madder root, yellow berries, sponges, and opium. The origin of Smyrna is lost in antiquity. It laid claim to the honor of being the birthplace of Homer, and no doubt was a Greek city as early as the date assigned to the poet. It was afterward taken by the Lydians, was restored by Antigonus and Lysimachus, generals of Alexander the Great, became the capital of Antigonus and a flourishing city. During the Roman civil wars it was taken and partly destroyed by Dolabella, but soon recovered. It early received Christianity, and was one of the "seven churches" of Asia. In the 13th century only the ruins of its former splendor were left; but after the Turks became masters of the country it revived. It has repeatedly suffered from earthquake. After the World War Smyrna was awarded to Greece, by whom it was occupied in 1919. Pop. about 350,000.

SMYRNA, GULF OF, formerly the Hermæan Gulf, an inlet of the Ægean Sea on the coast of Asiatic Turkey, so called from the town of Smyrna, which stands at its head. It is 40 miles in length by 20 at its broadest part, and contains several islands and affords good anchorage.

SMYTH [SAMUEL] NEWMAN [PHILLIPS], an American clergyman and religious writer; born in Brunswick, Me., June 25, 1843; was graduated at Bowdoin College in 1863; served as lieutenant in 16th Maine regiment (1864-1865); was graduated at Andover Theological Seminary (1867); held pastorates at Providence, R. I., Bangor, Me., Quincy, Ill., and New Haven, Conn. His publications include: "Old Faiths in New Light," "The Orthodox Theology of To-day," "The "Morality of the Old Testament," "Personal Creeds," "Christian Ethics," "The Religious Feeling," "The Reality of Faith," "The Place of Death in Evolution," "Through Science to Faith," "Constructive Natural Theology," etc.

SNAIL, the common name of gasteropodous mollusks comprising the numerous family *Helicidæ*. They feed chiefly on vegetable substances. The mischief which they do to garden crops is too well known. Snails delight in warm, moist weather; in dry weather, their chief time of activity is during the night, and they hide themselves by day; but after rain they come forth at any hour in quest of food. At the approach of winter or in very dry weather they close the mouth of the shell with a membrane (epiphragm), formed by the drying of the mucous substance which they secrete, and become inactive and torpid. Snails retreat into crevices for the winter, or into holes which they made in the earth, and which are roofed over with earth, dead leaves, etc., agglutinated by secreted mucus. The great vine snail, or edible snail (*Helix pomatia*), a European species, was considered by the ancient Romans one of their table luxuries. In some countries, as Switzerland and parts of France, they are cultivated for the table.

SNAITH, JOHN COLLIS, an English writer of fiction. He brought out his first work, "Broke of Covenden," in 1904, and this was followed two years later by "Henry Northcote." Since then his published works have included: "William Jordan, Junior," "Araminta," "Fortune," "Mrs. Fitz," "The Principal Girl," "An Affair of State," "The Great Age," "The Sailor," "Mary Plantagenet."

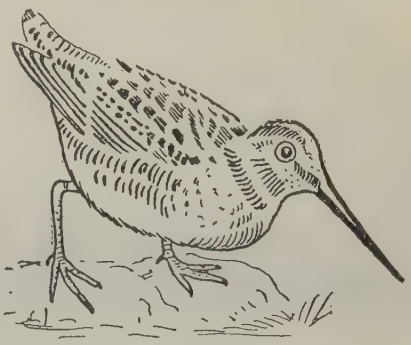
SNAKE, a serpent, any species of the order *Ophidia.* The best-known harmless snake is probably the common snake, known also as the ringed or grass snake. The black snake, of which there are two species, is also very common in the United States. The common snake has no poison fangs, but is furnished with scent glands which secrete a volatile substance of offensive and penetrating odor. Snakes are partial to damp situations and enter water readily, swimming with ease. They are very voracious and swallow their prey —frogs, mice, and small birds—alive and entire, their teeth, which are in two rows on each side of the jaws and directed backward, being too weak to tear or masticate. See SERPENT.

SNAKEROOT, the popular name of numerous American plants of different species and genera, most of which are, or formerly were, reputed to be efficacious as remedies for snake bites.

SNEEHÄTTEN (snā-het'en; "Snow-hat"), a mountain in Norway with an altitude of 7,566 feet. It rises from the midst of the Dovrefield, an extensive tract of country, from 40 to 50 miles in extent in every direction, and between 3,000 and 4,000 feet above the sea-level.

SNIDER, JACOB, inventor of a method for converting Enfield muzzle-loading rifles into breechloaders, originally a Philadelphia wine merchant; busied himself in inventions connected with dyeing, brewing, coach wheels, the sheathing of ships, etc., and went to England in 1859 to induce the British Government to adopt his system of breech loading or converting. In this he succeeded, but for one reason or another found himself unable to obtain the expected remuneration. He died Oct. 25, 1866, without having received the reward of his labors, worn out by delays, lawsuits, poverty, and debts.

SNIPE, the common name of the birds composing the family *Scolopacidæ.* There are many genuses, of which the genus *Gallinago* may be taken as the type. The common snipe of Europe (*G. media*), is about 11 inches in entire length, the bill almost 3 inches. The general color of the upper parts is a blackish-brown, finely mixed with pale-brown and a rich buff-color; three pale-brown streaks along the head; the neck and breast pale-rust color mottled with black; the belly white. The snipe makes a nest of a little dry herbage in a depression of the ground, or sometimes in a tuft of grass or rushes. The eggs are four in number, pale-yellowish or greenish-white, the larger end spotted



SNIPE

with brown. This species of snipe is plentiful in all the moory and marshy places throughout Europe, also in some parts of Asia, and it is found in the N. of Africa. The snipe is capable of being tamed. The common American snipe (*G. Wilsonii*) is about equal in size to the common snipe of Europe, and much resembles it also in plumage. This species is abundant in summer in the N. parts of the United States and in Canada, in the more southern States in winter. It is much in request for the table, and is often caught in snares.

SNIZORT, LOCH, a large inlet of the sea on the N. W. of Skye, between Vaternish and Trotternish, picturesquely studded with islands in its upper part. Length 16 miles; greatest breadth about 9.

SNORRI, STURLASON, an Icelandic poet and historian; born in Hvami, in the Dala district of Iceland, in 1178; was the son of Sturla Thordsson, the founder of the powerful family of the Sturlungs. At three years of age he became a foster-son of Jon Loptsson, grandson of Sæmund, author of the "Elder Edda," then the most influential and gifted man in Iceland, and after his death (1197), Snorri remained at Odda with his son Sæmund, and by his marriage, first with Herdys (1199), and after her death with Hallveg Ormsdatter, gained great possessions, sometimes appearing at the Althing with a following of 800 to 900 men. Twice was he appointed "Langmand" (1219-1223, and 1226-1236). In 1218 he traveled to Norway, where he gained great favor with Duke Skuli, returning to Ice-

land in 1220. In 1237 he was obliged to flee to Norway in consequence of a league formed against him by his brother Sighvat and his nephew Sturla. Here, by his poetical powers, he aided his patron Skuli in his war against King Hacon, but was in consequence, on his return to Iceland, pursued by the hatred of the king, and murdered through his influence by his son-in-law at Reykaholt, Sept. 22, 1241.

SNOW, in meteorology, water solidified in stellate crystals, variously modified, and floating in the atmosphere. These crystals arise from the congelation of the minute vesicles which constitute the clouds, when the temperature of the latter is below zero. They are more regular when formed in a calm atmosphere. Their form may be investigated by collecting them on a black surface, and viewing them through a strong lens. The regularity, and at the same time variety, of their forms are truly beautiful. These crystals are united together in such a manner as to reflect light to the eye in great abundance from all, thus producing a sensation of whiteness. The presence of air in snow renders it opaque, otherwise it would be transparent, like ice and other crystallized bodies. Regular crystals of snow are only found where the air is still and the temperature very cold; they do not, therefore, often occur in temperate regions. In the polar regions snow has been seen of red, orange, and salmon color. This phenomenon occurs both in the fixed and floating ice, and seems to result in some cases from vegetable, and in others from animal matter suspended in the water and deposited on the surrounding ice. In general, the electricity of snow is positive, and by chemical analysis it has been found that snow water contains a greater proportion of oxygen than rain or river water—a fact which accounts for its superior activity in causing iron to rust, etc.

In the economy of nature snow answers many valuable purposes. By its gradual melting in high regions it serves to supply streams of running water, which a sudden increase in the form of rain would convert into destructive torrents or standing pools. In many countries snow tempers the burning heat of summer by cooling the winds which pass over it. On the other hand, in colder climates snow serves as a defense against the severity of winter, where it protects plants against the frost and serves as a shelter to animals, which bury themselves in it. The elevation at which mountains are covered with perpetual snow is called the "snow line," or plane of perpetual snow. The snow line on the N. side of the Himalayan Mountains is 18,600 feet; on Chimborazo, 15,802 feet. The altitude of perpetual snow under the equator was fixed by Humboldt at 15,748 feet; toward the poles it is considerably lower. The snow line of the Alps, N. latitude 46°, is only 8,860 feet; and that of the Pyrenees about 8,850 feet. At the North Cape, in latitude 71°, it is only 2,300 feet. The position of the snow line in all mountains, however, depends so much on variable causes that no general rule can be laid down for determining the altitude of perpetual snow.

SNOW, ALBERT SIDNEY, an American naval officer, born at Rockland, Me., in 1845. He graduated from the United States Naval Academy in 1865 and reached the rank of rear-admiral in 1905. He saw service during the Civil War on the "Marblehead." During the Spanish-American War he was in command of the "Badger." His assignments included service at the Torpedo Station, Newport, R. I., the Boston Navy Yard, the coast survey service, the Naval Academy, the lighthouse service, the naval station at San Juan, and the Navy Yard, New York. He was retired upon reaching the legal age limit in 1907. From 1918 to 1919 he was president of the General Court Martial at the Boston Navy Yard.

SNOW, LORENZO, a Mormon apostle; born in Mantua, Ohio, April 3, 1814; was converted to Mormonism in 1836; became a missionary in 1837, and traveled in England and other countries; and on his return to the United States organized and captained the Nauvoo Legion, the body of Mormon troops in Illinois. He was a member of the Utah Legislature in 1852-1882; founded Brigham City, Utah; was ordained one of the Twelve Apostles of the Church in 1849, and succeeded Wilford Woodruff as president of the Mormon Church in 1898. He died in Salt Lake City, Utah, Oct. 10, 1901.

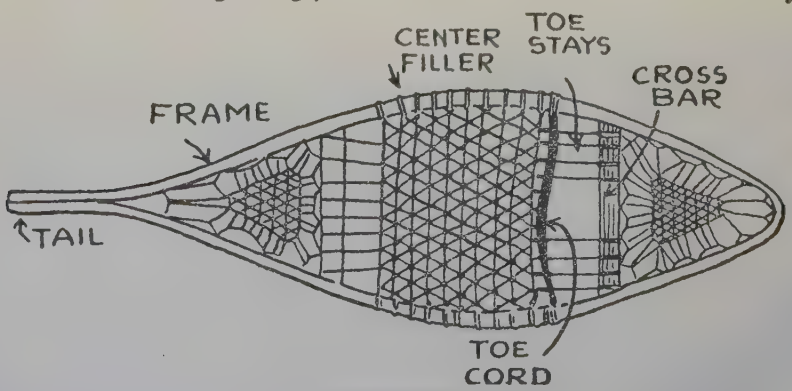
SNOWBIRD, the common name of the genus of birds *Junco*, family *Fringillidæ*, distinguished by their bill small and conical, the wings reaching the basal fourth of the exposed portion of the tail, and the tail slightly emarginate. The common snowbird or black snowbird, *Junco hyemalis*, of the United States E. of the Missouri, is 6¼ inches long; grayish or dark ashy black deepest before; the middle of the breast and belly, the under tail coverts, and the first and second external tail feathers white, and the third tail feather white, margined with black. These birds appear in flocks in winter and are very tame. They are fond of grass-seeds and berries; the flesh is delicate and juicy, and is often sold in the New Orleans market.

SNOWDEN, JAMES HENRY, an American theologian, born at Hookstown, Pa., in 1852. He was educated at Washington and Jefferson College and at the Western Theological Seminary. After having been ordained a Presbyterian minister in 1879, he served as pastor of churches in Huron, Ohio, Sharon, Pa., and Washington, Pa., until 1911 when he became professor of systematic theology at Western Theological Seminary, Allegheny, Pa. From 1898 to 1917 he was editor-in-chief of the "Presbyterian Banner." He wrote: "Scenes and Sayings in the Life of Christ" (1903); "A Summer Across the Sea" (1908); "The World a Spiritual System—An Outline of Metaphysics" (1910); "The Basal Beliefs of Christianity" (1911); "The City of Twelve Gates" (1916); "The Psychology of Religion" (1917); "Can We Believe in Immortality?" (1918); "The Coming of the Lord" (1919); "Is the World Growing Better?" (1919); "A Wonderful Night" (1919).

SNOWDON, a mountain range in North Wales; stretching N. N. E. to S. S. W. across Carnarvonshire from the mouth of the Conway to Tremadoc; length, about 24 miles; average breadth, 6 miles. It attains its greatest height in Snowdon proper, whose loftiest summit—Wyddva, 3,571 feet—is the culminating point of South Britain.

SNOWDROP, a well-known garden plant of the genus *Galanthus; G. nivalis,* natural order *Amaryllidaceæ.* It bears solitary, drooping, and elegant white flowers, which appear early in spring. It is a native of the Alps, but is quite common in gardens in the northern United States.

SNOWSHOE, a light frame made of bent wood and interlacing thongs, used to give the wearer a broader base of support when walking on snow. The tread of the shoe is formed of strips of raw-hide, hard twisted twine, or, among the Indians, of deer-sinews. In use the toe is placed beneath the strap and the foot rests on the thongs; as the heel rises in walking, the snow shoe is not raised, but as the foot is lifted, the toe elevates the forward end of the snowshoe, which is then dragged along on the snow as the leg is advanced. They are usually from three to four feet in length, and a foot to 18 inches broad in the middle. See SKI.



SNOWSHOE

SNOWY OWL, in ornithology, the *Nyctea scandiaca,* a native of the N. of Europe and America, visiting and breeding in the Orkney and Shetland Islands. In old birds the plumage is pure white, but in younger and adult birds each feather is tipped with dark brown or black. The length of the adult male is about 20 inches, that of the female four or five inches more. It flies by day and preys on the smaller mammalia and on various birds which it is able to capture.

SNOWY RIVER, a river of Australia, in New South Wales and Victoria; length, 240 miles, 160 of which are in New South Wales.

SNUFF, a fragrant powdered preparation of tobacco inhaled through the nose. It is made by grinding, in conical mortars or "mills" worked by power, the chopped leaves and stalks of tobacco in which fermentation has been induced by moisture and warmth in closed rooms. There are numerous varieties. Some, like the rappees, are moist; others, for example, the Irish and Welsh, are highly dried. A roasted Irish snuff called "Lundy Foot," or "Irish Blackguard," has wide repute for excellence. French rappee is superior to all others, and its manufacture has been brought to high perfection at the French Government factory. The tobacco is subjected to two processes of fermentation, whereby aroma and

strength are acquired, and the nicotine and organic acids removed. The consumption of snuff in the British Isles has been estimated to amount to 500 tons annually. The practice of snuff taking was introduced from America into France in the 16th century, and in the middle of the following century it was very general throughout Europe. The consumption of snuff greatly increased in England during the reigns of William and Anne, and snuff-boxes of gold, silver, precious stones, and enamels were then not uncommon. An average of about 17,000 tons are annually made in the United States, consumed principally by foreigners.

SOAP, strictly speaking, a salt consisting of a fatty acid in combination with a metallic base. In common parlance, however, the term is applied to the soluble salts formed by the union of the fatty acids with the alkalies. If oil and water be shaken together mechanical union will take place; but on allowing the mixture to rest, the oil will gradually separate and float on the surface of the water. If a small quantity of caustic soda or potash be added to the mixture, and it be then agitated, union will take place between the three bodies, a milky fluid being formed. If a sufficient quantity of alkali has been added, and the solution be boiled, it gradually becomes clear, giving rise to a soapy fluid, which froths strongly on agitation, presenting all the properties of a solution of soap. If to a portion of this clear liquid a strong solution of common salt is added, a peculiar curdling is produced. The liquid separates into a clear fluid, containing glycerin, while the curdy portion rises to the surface. This substance is the fatty acid of the oil, in combination with the alkali used and a certain proportion of water, and if pressed and dried, exhibits the properties of ordinary soap.

Ordinary soaps are of two kinds,—soft and hard. Soft soap is a combination of some fatty or oily substance with potash, and contains an excess of alkali; hence it is used for cleansing purposes where very highly detergent powers are required. The hard soaps are combinations of the fatty acids with soda; the principal varieties being yellow soap, made from tallow and palm oil, and containing a certain proportion of resin to give it lathering properties; curd soap, which is made from tallow, only a small portion of olive oil or lard being added, to give it softness; mottled soap, which is prepared from tallow, palm oil, and kitchen stuff, and contains a portion of insoluble iron soap giving it a marbled appearance. Marseilles and Castile soaps are made of olive oil and soda, a small quantity of sulphate of iron and sulphuretted lye being added to them while in a pasty condition. The object of marbling soap with an insoluble matter is to show that they contain but little moisture, since, if too large a proportion of water were present, the coloring matter would sink to the bottom and remain there, instead of being diffused through the mass.

The United States stands at the head of all other countries in the use if not in the manufacture of soap. New York, Illinois, New Jersey, Ohio and Pennsylvania lead, in the order named, all other states. Over 2 billion pounds of hard soap (including about 170,000,000 pounds of toilet-soap) are annually produced and 57,000,000 pounds of soft soap.

SOAPSTONE, or **STEATITE,** a hydrated silicate of magnesia. It is a massive variety of talc, which, when pure and compact, is much used as a refractory material for lining furnaces. It is easily turned in the lathe, or cut with knives and saws, and is made into culinary vessels. When reduced to powder it is used like plumbago as a lubricator and to diminish friction.

Soapstone slabs are extensively used for manufacturing into laundry, bath and acid tubs, and in chemical laboratories, as also in the manufacture of different varieties of stoves, mantels, linings, heaters, caskets, assay furnaces, gas burners, and wherever acids are used or there is a necessity to retain heat, or where a fireproof article is necessary. See TALC.

SOAR, a river of England, which flows N. through Leicestershire, taking Leicester on its course, and joins the Trent about 12 miles E. S. E. of Derby, whence to Leicester it is navigable by barges.

SOBRANJE, the national assembly of BULGARIA (*q. v.*).

SOCIAL CONTRACT, or **ORIGINAL CONTRACT,** that imaginary bond of union which keeps mankind together, and which consists in a sense of mutual weakness and dependence. Jean Jacques Rousseau maintained that the natural and proper state of man is the savage state, when he possesses complete liberty, and that every social organization is an infraction of natural right. All men he believed are born equal, and society is founded on a social contract. His views on the subject prepared the way for the first French Revolution.

SOCIAL, or **PUBLIC, HYGIENE,** the science of caring for the physical well-being of entire communities, as simple hygiene is the science of guarding the physical welfare of the individual against

disease. Obviously the former is more than the latter on a larger scale, for the living together of large numbers of people creates dangers that do not necessarily threaten the individual. It is only within recent years that social hygiene has affected the public policies of municipalities or states, but its importance is of the highest order, since it is due to the application of the laws of social hygiene that the fatal epidemics of the earlier periods of history have been banished. What were commonly known as plagues in olden times were, in the light of modern science, nothing but such dirt diseases as smallpox and malarial fevers, none of which can flourish where the precautions dictated by a knowledge of hygiene are applied. To a lesser degree the same may be said of all contagious diseases. The rules of hygiene are chiefly based on the knowledge that most contagious diseases are caused by foul air, which, first of all, robs the body of the vitality which, in good health, enables it to throw off the attacks of disease germs; by filth and dampness, in which the disease germs are incubated; and the various methods by which these germs are transmitted from their places of incubation to the vulnerable parts of the human body. Social hygiene, therefore, as enforced through state laws and municipal ordinances, demands the removal of all filth; clean streets, removal of garbage and proper disposal of sewage; a certain minimum amount of air space per individual in human dwellings, with proper ventilation, as illustrated in the tenement house laws of large cities; careful inspection of sources of food and water supply, that infection may not be carried by this medium; and, finally, when sickness has made its appearance, measures for the segregation of those already affected. The abolition of public drinking cups is another illustration of the precautions against disease demanded by modern social hygiene. The result of not enforcing laws and ordinances in this field may be witnessed in the present condition of the large cities of Russia, where, in some cases, epidemics have reduced the populations by a third. During the World War the United States Federal Government became especially interested in social hygiene, on account of the precautions that had to be taken against epidemics in the mobilization camps. The greatest enemy here encountered, however, was found to be venereal diseases. As a consequence of what was learned by investigation during this period, the Federal Government has decided to continue its activities in this field on a permanent basis. The agencies through which it works are: The United States Public Health Service, the Inter-Departmental Social Hygiene Board and Army and Navy Departments. These first began to function in the summer of 1918. The second of these institutions, created by an Act of Congress, passed July 9, 1918, received an appropriation of four million dollars. As a result of the activities of these Government institutions, 96 laws were passed in 1919, in various States to protect society against venereal diseases. During 1919 all these institutions together treated 35,000 cases.

SOCIAL INSURANCE, one of three distinct branches of insurance in general, the other two of which are commercial insurance and mutual insurance. Both of these are voluntary in nature, and protect those who have the initiative to take proper precautions against the misfortunes which insurance covers. Social insurance is that branch which endeavors to protect that weaker and more thriftless element of the population which does not, or cannot, protect itself, usually the lower paid classes of the workers. As defined by a pamphlet of the United States Government, it is a "method of organized relief by which wage-earners, or persons similarly situated, and their dependents and survivors, become entitled to specific pecuniary or other benefits, on the occurrence of certain emergencies." The medium is generally through government institutions, in combination with employers and the beneficiaries themselves. In most European countries the government contributes one-third of the insurance fund, the employees, or beneficiaries, and the employers, contributing the rest. These contributions are sometimes voluntary, in which case the contribution of the government is in the nature of a subsidy. Where they are compulsory the insurance is in the nature of workingmen's compensation law. Social insurance was first established in Germany, by Bismarck, who was much influenced by the Socialist teachings of Ferdinand Lasalle. In the United States workingmen's compensation laws were not passed until about ten years ago, but the movement in their favor has since become very strong. Social insurance usually is divided into the following branches: accident, occupational diseases, non-industrial accidents, general illness, maternity, employers' liability, invalid, old age, funeral, widows and orphans, and unemployment. These heads, it will be seen, cover almost all the evils to which the mass of the people are subject, and it is believed by many statesmen and economists that social insurance, when carried out to its fullest limits, may entirely abolish all those social evils con-

sequent on our present industrial system. The first national convention on Social Insurance was held in Chicago, in June, 1913, and the second, under the auspices of the United States Government, was held in December, 1916.

SOCIALISM, in its broader meaning, is the conception that the production and distribution of all those commodities which satisfy the wants of the people should be under the collective, democratic control of the people as a whole, with the result that *use* would be the only incentive to industry, and that the private profit of capitalistic enterprise would be eliminated as an element. With this definition no Socialist will quarrel. It is chiefly in how this end is to be achieved, and the form in which the public industries are to be administered, that Socialists differ, on which differences are based the various groups, some of which are so widely separated in their sympathies from the others that only by the broadest generalization may they be considered as the component parts of the one movement.

Socialism had its origin in the invention and establishment of steam-driven machinery, by which means the handicrafts system of production was gradually transformed into the present large scale system of capitalist industry. Previous to the introduction of machinery each worker had produced commodities in his home and sold his surplus to his immediate neighbors. Such inventions as the power loom not only multiplied the productive power of the individual workers many hundreds of times, but made necessary the factory system of production, whereby great numbers of men and women were brought together under the roof of the factory which housed the machinery. The machinery, however, remained the property of one owner, on whom all the workers became dependent for their means of livelihood, since large scale production, by its vast superiority, had killed the handicrafts industries. This autocratic, economic power over the workers enabled the owner of the machinery to dictate the terms on which they were to work, with the result that the hours became as long as human endurance could bear and that wages were cut down to the barest means of subsistence. From these conditions, growing gradually worse, trades unionism had its inception. The workers banded together for mutual protection against the masters, and by the strength of their organization were enabled gradually to counteract the evil tendencies. The vast improvements in the conditions of the workers during the past century are largely the result of the activities of the labor unions, together with the legislation in their favor inspired and supported by them and their sympathizers. But since their object is merely to increase wages and shorten the hours of the working day, they are not, in themselves, in any way a part of the Socialist movement.

Socialism had its definite origin in those groups of keen idealists who immediately saw the injustice in a system which provided that the machinery of social production should be in the hands of private ownership. They held that since the factories produced the needs of the people, for their consumption, the people should own and control them. Or, a little more definitely, since the workers used the machinery of production to produce the needs of life, they should own them, as they had owned their own tools under the handicrafts system. This latter conception, somewhat more narrow, was undoubtedly the first. It persists to the present day in the Guild Socialist and Syndicalist movements, off-shoots of the main Socialist movement, and will be considered later.

The first one to formulate the idea of collective ownership of the tools of production was Robert Owen, himself not a workingman, but, peculiarly enough, the owner and manager of a large textile factory in New Lanark, on the Clyde. Owen has been considered the father of Socialism, in England at least. Owen improved the conditions of the several hundreds of workers in his own mills, shortening the hours and raising wages, limiting child labor, and then strove heroically to persuade other employers that self-interest, if not a sense of humanity, should impel them to follow his example, since better conditions enabled his workers to reach a higher degree of productiveness. He was, however, only scornfully laughed at, and his failure led him to elaborate more radical schemes for the betterment of the workers. He, therefore, presented various plans for the establishment of isolated communist colonies, in which factories were to be established, to be owned collectively by the colonists, the profits of their industry to be shared equally between them. These plans were in several cases actually carried out, one of them in this country, at New Harmony, Ind. All failed, but Owen nevertheless made a strong impression on a number of educated Englishmen, who accepted his fundamental principles and modified them in an effort to render them more practical.

At about the same time, during the first two or three decades of the last century, François Fourier, in France, was proposing similar communist enterprises,

wherein workers were to establish isolated colonies and produce and enjoy collectively. Fourierism made some impression in this country, and was taken up actively by Horace Greeley and Albert Brisbane in the forties. The communist colonies resulting from their preachings and writings form a whole phase of the early history of Socialism in this country, though they, too, met nothing but failure.

This is what is generally known as the Utopian stage of Socialism, in which idealists sought to jump immediately to idealistic conditions, merely by organizing society on their principles. This was followed by what modern Socialists call scientific, or evolutionary, Socialism, which they declare has its basis in the laws of social evolution.

The founder of this more elaborate scheme of social betterment was Karl Marx, who was born of Jewish parents, in Treves, Prussia, in 1818, and had the advantages of a first class education, studying at Jena, Bonn and Berlin. As a result of the revolutionary disturbances in Germany, in 1848, he was expelled from Prussia and settled in London, where he made a meagre living as London correspondent for Greeley's New York "Tribune." For several years he studied political economy and kindred subjects in the British Museum Library. The result of his long labor was a voluminous work, "Capital," which he published in German, in 1867. This work is the Bible of a large proportion of present-day Socialists.

Marx, however, had already published his ideas on Socialism, in collaboration with Frederich Engels; together, in 1848, they had issued what is considered by their many followers the most important piece of literature in the history of Socialism, the "Communist Manifesto." Though only in the form of a short pamphlet, probably no other piece of literature, except the Bible, has been more frequently quoted. Nor has any other writing, except the Bible, been more variously interpreted.

Three theoretical propositions constitute the fundamental basis of the "Communist Manifesto." They are: the materialist conception of history; the class struggle; and the theory of surplus value. The first implies that all history, that is, the activities of all nations, has been dictated by economic conditions. The second implies that through all history there have always been two classes antagonistic toward each other; the master class, living parasitically on the second class, which is made up of the workers, the producers. This class struggle, under the capitalist system, centers about surplus value, which the master class extracts from the working class at the point of production. The workers are compelled to work with tools owned by the capitalist class. For this work they receive merely enough wages to subsist, while the surplus value of their labor is appropriated by the capitalist class. The higher the degree of perfection in machinery and large-scale factory organization, the bigger becomes this margin, and the more powerful becomes the capitalist class. Correspondingly the pressure on the working class grows, until it becomes intolerable, and the latter rises in revolution and overthrows the master class.

Marx, Engels and their disciples were not interested in politics, in the form of political parties. This was natural, since at that time the suffrage was very much restricted in European countries. The change would not be brought about by politics, but by an intensification of the class struggle. Agitation should be carried on to create "class consciousness" among the workers. The intensification of the misery of the workers would be an ally of the agitators. Finally, when class consciousness had become a quality of a large majority of the workers, they would rise in revolution, overthrow the master class and seize political power, which would bring about the "dictatorship of the proletariat." Once in power, the proletariat would organize industry on a collective basis, all members of society would have to become workers, and class rule would give place to pure Socialism, or Communism. This is the program of the purely Marxian Socialists. These are the principles on which was founded the International Workingmen's Association, in Paris, in 1864, and which a few years later was removed to New York in a moribund condition, there to be unobtrusively interred.

For the Marxian program did not work out according to schedule. Trade unions improved the conditions of the workers. Legislation, backed by so-called capitalist parties, also improved their conditions. Suffrage was widened, and the political parties bid for the support of the working classes. All this tended to impede the development of "class consciousness" and of its final climax, the social revolution.

Finally the rank and file of the socialist organizations began to insist on participation in politics. They wanted candidates elected to office, especially representatives sent to the legislative bodies. The staunchest of the Marxians fought this tendency, some to the present day. These have been known as the "impossibilists," or "direct actionists."

The majority, however, succumbed to the prospects of political party power.

The first Socialist representatives elected to legislative bodies were sent to the North German Diet, in the seventies, and soon after Socialist political parties were formed in other countries as well.

From that day until the present there has been a steady growth in all countries, of the Socialist political parties and of the number of their representatives in the governing bodies. But even within the parties themselves there continued the original split, between those who, while willing to have their representatives elected to legislative bodies, did not believe they should support reform legislation; and those who supported all legislative measures for the betterment of the masses.

The first believed that all reform measures retarded and even checked the growth of class consciousness, therefore delayed the social revolution, which was to be the means by which the proletariat would achieve power. The latter succumbed to pressure from below, and followed the dictates of the rank and file, who, little interested in abstract theories, wanted their material conditions improved.

This partisanship between the Marxian theorists and the practical politicians in the movement continued, now and then breaking out into violent party dissentions. It remained for the recent World War to bring about an open split.

In the United States the Socialist Labor Party was organized in 1877. Its chief was Daniel De Leon, a true Marxian, though he believed in political activity for its propaganda value. As the Socialist Labor Party met with little or no success at the polls, it was not tempted to deviate from its Marxian principles, since its chiefs were not elected to office.

In the late nineties, however, a growing number of native Americans were converted to Socialism, including Eugene Debs, a prominent labor leader, and dissatisfaction with the policy of the German Socialists who had formed the bulk of the Socialist Labor Party began to manifest itself. In 1900 came a split; the Socialist Party was organized, and in the presidential elections of that year it polled nearly 100,000 votes. Henceforward the Socialist Labor Party dwindled in strength, while the Socialist Party developed rapidly, polling 901,361 votes in the presidential election in 1912. This later party frankly adopted a platform of reform measures, and while it did not repudiate the Marxian theories, it made the development of its political strength its chief aim. Its appeal has been openly to the people as citizens, or consumers, while its championship of the workers at the "point of production" has been chiefly confined to the editorials of its official organs. In 1912, at a national convention, held in Indianapolis, the "direct actionists," those who remained true to the old Marxian program of mass revolution, were definitely thrown out.

In 1899 the first international Socialist Congress was held, and thereafter a similar international meeting was held every three years, for the purpose of formulating common action. Needless to remark, the politicians were behind these congresses, and of these the German Socialists were dominant. German Socialism, which had built up the biggest political party in Germany, remained the ideal of the Socialists in all other countries, with the exception of England, where, through the influence of the Fabian Society (*q. v.*), the Labor Party had been gradually developed with a platform based simply on an extension of government enterprise. The Continental parties, at least, still held that it would be useless to support state industrial enterprises until the government had been definitely captured by the Socialist votes.

In 1900 the "Second International" was organized, in the International Socialist Bureau which was established in Brussels. This central bureau functioned until the outbreak of the World War, when, not so much through the interruption of communications, as because of the action of the German Socialists in supporting their Government in the war, it was disrupted. Political activities, naturally, had developed a corresponding degree of nationalism in the Socialist parties, though the Marxian program had emphasized very strongly the international character of the Socialist movement and specifically pointed out that the brotherhood of the proletariat was more important than patriotism, which was considered merely a medium by which the ruling classes divided the solidarity of labor. The true Marxians in Germany were represented by such leaders as Rosa Luxemburg and Karl Liebknecht, who refused to support the war and suffered imprisonment therefor. In this country, when the time came, the Socialist party stood strongly against the war, not so much, perhaps, on account of Marxian principles, as because a large portion of the rank and file was of German birth.

For the first two and a half years of the war Socialism in all countries remained practically quiescent. It had been shocked insensible by the unexpected effect that the war had had on itself.

Then came the revolution in Russia, in March, 1917. Essentially this began as a protest of all classes of society against the incompetence and the treason of the ruling autocracy, but the Socialists were

the only ones who had the organization needed to hold the revolutionary masses together, through their Council of Workingmen Delegates, which was hastily called into being for the purpose. The Socialists only were capable of coherent action, and therefore the power fell to them. Certainly they had not had any more than their proportionate share in creating the overturn.

The rise into power of the Socialists in Russia suddenly revived Socialism in other countries. In May, 1917, the Council of Workingmen Delegates, which while not itself the Government, was at any rate the biggest unit of power behind the Government, issued a call to all Socialists in other countries to hold an international conference in Stockholm, where war aims should be discussed and mutually agreed upon.

The Stockholm Conference was not held, as practically all the belligerent governments refused to issue passports to the delegates, but nevertheless there had been a willingness on the part of the national organizations to be represented. If the Socialists could not prevent the outbreak of the war, they felt that at least they might capture the honor of ending it. The statesmen of the parties in power were determined that they should not have this honor, and successfully defeated their hope.

From now on there was a steady effort to revive the International. In the fall of 1918, after the signing of the armistice, there was held in London an Inter-Allied Labor and Socialist Congress, which found its most radical expression in an indorsement of President Wilson's "fourteen points." This conference called an international conference to be held at Berne, Switzerland, in February, 1919. To this came the German Socialist delegates, representing not only the German Socialist Movement, but the German Socialist Government, which had been captured by the old German Socialist politicians. This conference of the Second International declared itself for "parliamentary" Socialism; that is, for a continuation of the political party policies which had been adopted against the protests of the Marxians.

Meanwhile, in Russia, the Bolsheviki had captured, first the Council of Workingmen Delegates, and then, in November, entire control of the government. The Bolshevist leaders were true Marxians, as they showed when they disbanded the Constituent Assembly, the creation of a parliamentary régime, and established the "dictatorship of the proletariat." They had come into power, however, not through the class consciousness of the workers, but through the discontent of the peasantry with carrying on further warfare.

The Bolsheviki repudiated the Berne Conference. This stand by the Russians immediately awoke the Marxians in all countries, and now came such a split as had never existed before.

On March 2-6, 1919, all these elements came together in Moscow and there, under the leadership of the Bolshevist chiefs, formed the "Third International." As the Germans formerly dominated the Second International, so now, even more autocratically, the Russians dominated the Third International, which they term the "General Staff of the Social Revolution." The third stands for the old Marxian program, by which "class consciousness" is to be developed until it has acquired such strength that it can, by forcible means or otherwise, overthrow the capitalist system and set up its dictatorship of the proletariat.

The Second International stands for the parliamentary method. By increasing its electoral strength it hopes gradually to permeate all existing governments and so accomplish its ends more peacefully and by a more evolutionary process. Its representatives are in power in Germany, Austria, Czecho-slovakia, and, until late in 1920, were so in Sweden. It is supported by the Socialist party majorities in about two dozen countries.

In May, 1920, the American Socialist Party held its national convention and passed a resolution supporting the Third International, with the important reservation, however, that it did not believe it feasible to adopt the revolutionary program culminating in the dictatorship of the proletariat. In March, 1920, the Third International held its second convocation in Moscow. Several months after that, and after the resolution passed by the American Socialists in May, the Executive Committee of the Third International presented twenty-one points which the American Socialist Party must indorse before it would be admitted to join. Among these points were: that the editors of the Party organs must be men who had declared themselves Communists previously, or, in other words, the present editors must all be dismissed and replaced by members of the Communist Party. The document read like terms presented to a defeated foe by a mighty conqueror. These terms were finally rejected by the National Executive Committee of the American Socialist Party, in December, 1920, and at that time there seemed little doubt that the party membership referendum would, when it took place, reverse the previous decision to join the Third International. This will mean the withdrawal of all the Slavic

and Finnish affiliated organizations, and reduce the membership of the American Socialist Party to something like 7,000, as compared to a membership which once stood at 140,000. A split had already taken place in August, 1919, in Chicago, when a large minority walked out of the convention hall, and formed the Communist and the Communist Labor parties, both of which organizations have since been driven underground by the prosecutions of the state and Federal authorities.

The origin, development and the principles of the chief Socialist organizations having been set forth it remains only to describe briefly several important offshoots of the main official movement. First of these is Syndicalism, which had its origin in the French labor movement. Syndicalism represents a reaction against State Socialism, to which, obviously, political action would lead. Syndicalists hold that the State should be practically abolished, as it exists at present, at least, and that the industries should be owned and controlled by the organized workers employed in them. The school teachers should own the schools, the postal employes should run the post office and the railroad workers should have full charge of transportation. The American representative organization of this movement is the I. W. W.

Against this conception there has been still another reaction, originated in England, known as Guild Socialism. The movement is worthy of special notice, for while it remains comparatively small as on organization, it has nevertheless captured the younger elements of the British Labor movement. Its program is almost perfectly represented in this country by the Plumb Plan of the American railroad brotherhoods for the nationalization of the railroads.

The Guild Socialist program was first formulated, shortly before the World War, in the writings of G. D. H. Cole, an English writer, and A. R. Orage, editor of the "New Age." The idea is simply a combination of state ownership and control by the labor organizations. The state is to own the sources of raw material and the machinery of production. The workers, organized into "guilds," or industrial unions, are to control, each its own industry, regulating working conditions and prices. There are also to be consumers' guilds, representing those who will consume the output of the guild factories, and these will have charge of distribution. Apparently they will have very little to say about the prices they are to pay to the producers' guilds for the commodities they consume. Nor is it definitely stated what value will there be in state ownership of industries without control. "Guildsmen," as they term themselves, do not emphasize political action. Their plan is to permeate the labor organizations with their idea, cause them to organize on an industrial basis, and, finally, by sheer weight of their economic strength, take over the industries.

Another form of Socialism, using the word in its very broadest sense, is Consumers' Co-operation, whose origin is older than that of Marxian Socialism, and which has ever since pursued its own course. It is the only form of collectivism which has demonstrated itself in actual practice. Here, society as a whole, as a general organization of consumers, will own and control, while labor will be in the service of society, on the old wage basis, modified by some system of joint-control, in so far as working conditions are concerned. Co-operation, however, has no theoretical program, but follows obediently in the wake of its own successful experiments, though its declared ideal, in common with all Socialists, is the Co-operative Commonwealth.

SOCIALISM, INTERNATIONAL, first assumed form in the International Workingmen's Association, organized in Paris, in 1864, of which Karl Marx, Friedrich Engels and Michael Bakunin were the leaders. It never prospered, and its headquarters were, a few years later, removed to New York, where it gradually faded out of existence. The second international organization of Socialists was effected, temporarily in 1889, when the political Socialist parties of all countries began holding their international congresses. A permanent Bureau was finally formed in 1900, with headquarters in Brussels, Belgium. This was removed to the Hague at the outbreak of the World War, in 1914, but for the entire duration of the war remained inactive. It was revived at Berne, in February, 1919. In March, 1919, a Third International was formed in Moscow, which repudiated political action and declared itself for violent revolution. (See SOCIALISM.)

SOCIALISTS, CHRISTIAN, a name first taken by a small group of English reformers, in the forties of the last century, led by Vansittart Neale, Tom Hughes, author of "Tom Brown's School-days," and Canon Charles Kingsley, the noted novelist. They attached the "Christian" to their Socialism to distinguish themselves from the revolutionary Socialists led by Marx and Engels, and to indicate their repudiation of Robert Owen's atheism, whose economic theories, however, they adopted in large part. They are undoubtedly the natural prede-

cessors of the modern Syndicalists, in that they believed that the workers should own the tools of production. This they wished to bring about by establishing self-governing workshops, which should be owned by the employes and the profits of which should be divided among the same employes. Their experiments never showed the vitality of growth, and the movement, also known under the name of productive co-operation and co-partnership, is today practically dead.

More recently a group of Marxian Socialists has appeared, which bases its propaganda on the belief that the teachings of Christ were essentially Socialistic, in that they advocated the brotherhood of man and denounced the possession of riches. This point of view is most ably expounded in Bouck White's "The Call of the Carpenter" (1912).

SOCIAL SCIENCE, the systematic investigation of questions relating to public and domestic hygiene, education, labor, the punishment and reformation of criminals, the prevention of pauperism, and the like. The "Sociétés de Bienfaisance" (Beneficent Societies), established in France in the 18th century, were founded for the purpose of discussing similar matters, and the National Association for the Promotion of Social Science originated in a meeting, in 1857, at the house of Lord Brougham (1778-1868), when he was appointed the first president. The association held annual meetings, and published its proceedings, classed under the heads of Jurisprudence, Education, Punishment and Reformation, Public Health, Social Economy, and Trade and International Law, but its action was temporarily suspended in 1884. Since its establishment social science has made great advances in most civilized countries, notably in precautions against disease, the reconstitution of hospital charities, the regulation of prisons and workhouses, the establishment of reformatories for young criminals and penitentiaries for fallen women, and the extension of middle-class and industrial education. The word has also been used to designate the science now termed SOCIOLOGY (*q. v.*).

SOCIAL SCIENCE ASSOCIATION, AMERICAN, was founded in Boston, Mass., in 1865, for the purpose of investigating and studying all those social problems which come under the following heads: community health; education and art; social economy; finance; and jurisprudence. The membership of the association throughout the country is at present about 1,200. Its official organ is "The Journal of Social Science."

SOCIAL SERVICE, AMERICAN INSTITUTE OF, an organization whose purpose it is to serve as a clearing-house of information regarding social institutions for the betterment of society in all countries. At first known as the League for Social Service, it was reorganized under its present name in 1902. Its work is divided under the following heads: gathering facts on social and industrial betterment; interpreting these facts and tracing their causes; and to make known results obtained by the various social betterment institutions in all countries. As an instance, when an employer desires to establish profit-sharing in his firm, the Institute will save him the trouble of an extensive investigation into the subject and supply him with the material.

SOCIAL SETTLEMENTS, groups of social workers who live among the lower classes in the slum districts, first, to obtain first hand information of conditions which create poverty, and, second, to offer relief and educational assistance at first hand. The idea of obtaining such close contact with the sources of social misfortune originated with the Christian Socialists an association of educated Englishmen who were active during the middle of the last century. One of these, Edward Dennison, was the first who went to live among the poor of London, in 1867, to obtain first hand information of social conditions among them. Another deeply interested student was Arnold Toynbee, who, on his death, left a legacy which was to be devoted to the establishment of what was to be the first social settlement, Toynbee Hall, opened in London, in 1885. Only two years later the Neighborhood Guild, now known as the University Settlement, was opened in New York City. The largest social settlement in this country is Hull House, opened in Chicago, in 1889, at whose head is Jane Addams. Its influence has extended all over the city of Chicago, and the results of its sociological studies form an important part of sociological literature in general in this country. The object of the settlement house is strongly in contrast to that of any charitable institution in that it seeks to stimulate the poverty-stricken classes to improve their condition by their own efforts. To this end clubs and associations are organized among the people of the neighborhood for the purpose of studying a multitude of subjects and for self-improvement. Credit unions are formed for the purpose of assisting mutually those who may meet unexpected misfortunes. As another instance, the Neighborhood Guild Settlement House, in New York City, has organized among the women of its neighborhood a co-operative society, which carries on a successful grocery store business through which the

members obtain many of the necessaries of life at lower cost. Many other settlements stimulate their neighbors to purchase their winter supplies of coal by this method. Other settlements devote much attention to the training of mothers. One, the Nurses' Settlement, in New York City, sends trained nurses to the homes in a wide district in cases of sickness, especially in maternity cases. Throughout the large American cities there are about one hundred settlement houses.

SOCIAL WAR, the name of a noted struggle in Roman history. M. Livius Drusus proposed a law for investing the Italian allies with the privileges of Roman citizens; but it was strongly opposed by the senators, the knights, and the people, and Drusus was assassinated 91 B. C. The Marsi, who took the lead (whence the name Marsian or Marsic, also given to that war), the Peligni, the Samnites, the Lucani, and almost every nation in Italy except the Latins, Tuscans, and Umbrians, revolted and established a republic in opposition to that of Rome. In the first campaign the Romans met with some severe losses. Nola was taken by the Samnites; the consul, P. Rutilius, and his lieutenant, Q. Cæpio, were defeated and slain, and many cities were captured. On the other hand Sylla and Marius obtained a great victory over the Marsi, and L. Cæsar defeated the Samnites. In the second campaign, 90 B. C., the Romans defeated the Marsi and induced them, together with the Vestini, Peligni, and Marrucini, to make a separate peace. Sulla, the Roman general, destroyed the town of Staliæ, defeated a large army near Nola, reduced the Hirpini to subjection, and defeated the Samians. The Romans were induced, hearing that Mithridates VI., King of Pontus, intended to aid the allies, to adopt measures of conciliation, and one state after another submitted and received the gift of Roman citizenship. After the close of this campaign the war dwindled away till it was brought to a conclusion, 88 B. C., by the remainder of the Italian states receiving the concessions they required. During this war, called the Social War, 300,000 men were slain.

SOCIETIES FOR ETHICAL CULTURE. The first Ethical Culture society was founded in New York City in 1876, by Dr. Felix Adler, who was then a lecturer at Cornell University. His object was to offer a substitute for the orthodox church to those who had abandoned belief in orthodox religion, forming a movement which should retain the ethical teachings of the churches without their religious ceremonies and rituals. The original society in New York later established a kindergarten and a school for older children which became models of their kind in this country. The latter was the first to adopt manual training and demonstrate its value as a medium for education. Similar societies were soon organized in other American cities, and, later, in Berlin, Paris, London and other large European cities.

SOCIETY ISLANDS, an archipelago in the South Pacific, lying between lat. 16°-18° S., and lon. 148°-155° W. There are 13 principal islands, besides numerous islets, and the total area of the group is estimated at 734 square miles. The chief islands are TAHITI and Moorea. The first has an area of 600 square miles; pop. about 11,600; the latter an area of 50 square miles; pop. 1,500.

The Society Islands are of basaltic formation and abound in lofty and precipitous mountains usually fringed by a belt of flat land. Two peaks in Tahiti are respectively 7,000 and 8,700 feet high. Coral reefs are very abundant round all the islands. The soil being extremely fertile and water plentiful, the vegetation of the islands is most luxuriant. The climate is healthy, but enervating, and terrible hurricanes occur from time to time. The inhabitants belong to the Polynesian race and are handsome, brave, and intelligent, but indolent, fickle, immoral, and passionately fond of ardent spirits. On account of their indolence Chinese and Hervey Islanders are imported to work the cotton plantations. The people of Huahine, however, are enterprising traders, and their flag is seen as far away as San Francisco. The chief exports from the islands are cotton, cocoanut oil, copra, pearl shell, and oranges. The Society Islands were discovered by De Quiros in 1606, but were first made known to the world by Cook, who visited them in 1769, and named them after the Royal Society, at whose recommendation the expedition which he commanded was fitted out. They have been the scene of missionary labors since 1797, and have for many years been entirely Christian. Taking advantage of a quarrel between the Protestant and Roman Catholic missionaries, the French espoused the cause of the latter, who were the last in the field, and seized the islands in 1844. In 1847 they were expelled by the natives from Huahine, Raiatea, and Bora-Bora, which, with small dependencies, were again ruled by their own sovereigns. The entire group was officially annexed by France in 1880. A hurricane of great severity nearly wiped off the population of Tahiti early in March, 1906. It lasted some seventeen hours, and the wind reached an hourly velocity of 120 miles.

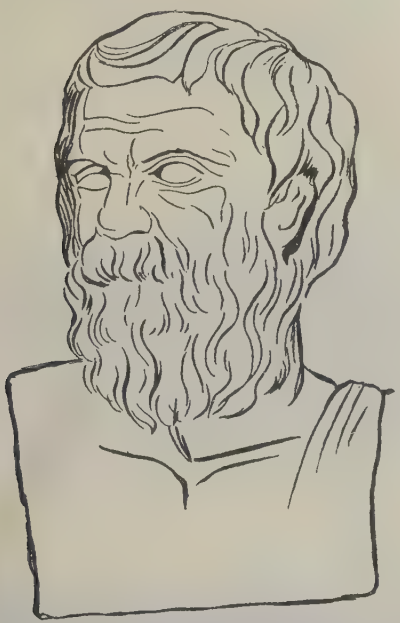
SOCIETY FOR PSYCHICAL RESEARCH, a society founded in England in 1882 under the presidency of Prof. H. Sedgwick, of Cambridge University, for the purpose of "making an organized attempt to investigate that large group of debatable phenomena designated by such terms as mesmeric, psychical, and spiritualistic." Six committees were appointed to examine (1) the nature and extent of any influence which may be exerted by one mind on another otherwise than through the recognized sensory channels; (2) hypnotism and mesmerism; (3) obscure relations between living organisms and electric and magnetic forces; (4) haunted house and ghosts; (5) spiritualism; (6) for the collection of existing evidence in connection with these subjects, and especially in connection with apparitions at the moment of death, or otherwise. A special committee was also appointed in 1885 to investigate the remarkable occurrences which the Theosophical Society claimed to have witnessed. All these committees, however, were subsequently dissolved, and experimental investigation and the collection of evidence left in the hands of individual members, the results of their inquiries to be embodied in papers and read before the society, and also, if they desire, to be published by them. The society has published reports containing papers on thought reading, on mesmerism, on apparitions and haunted houses, and on many other similar subjects. It has a membership of more than 900, with a branch in the United States with more than 500 members and associates; publishes monthly "Proceedings"; and has already gathered quite a large library of works in various languages, all bearing on topics of a more or less mysterious character. Articles on various subjects have also been contributed by members of the society to various magazines. All that the "investigations" have done has been to bring together a mass of so-called evidence in the form of testimony from persons who claim to have seen or experienced something abnormal or out of the common way. See PSYCHICAL RESEARCH.

SOCIOLOGY, the science of the evolution and constitution of human society. It has for its subject the origin, organization, and development of human society and culture, especially on the side of social and political institutions. Sociology embraces all social phenomena under their statical and dynamical aspects. It is the study of the conditions of existence and permanence of the social state; social dynamics studies the laws which govern the evolution of society. The field of ANTHROPOLOGY (*q. v.*) is usually restricted to the discussion of the earlier stages of social development and survivals from that stage into the present. It is claimed for Comte that he created the science of sociology, but according to Mill he only rendered such a science possible. Lewes points out that Macchiavelli, Montesquieu, Adam Smith, and Benthan had a full conviction that social phenomena conformed to invariable laws, but that it was reserved for Comte to bring them under his "law of the three stages," and to show that all societies pass through a theological, a metaphysical, and a positive stage.

In Great Britain the name of sociology has been given to the study of all that relates to the social improvement of the community. A society called "The National Association for the Promotion of Social Science" was organized at a meeting held under Lord Brougham's auspices in July, 1857, to consider the best means of uniting together all those interested in social improvement; and till 1884 held annual congresses in large towns throughout the United Kingdom. THE AMERICAN SOCIAL SCIENCE ASSOCIATION is similar to the British; it dates from 1866. See SOCIAL SCIENCE.

SOCOTRA, an island in the Indian Ocean, 150 miles E. by N. from Cape Guardafui, and 220 from the S. coast of Arabia; 70 miles long by 20 broad; area, 1,380 square miles. The interior embraces numerous barren plateaus (1,500 to 2,000 feet), with several well-wooded mountains rising to 4,500 feet; there are fertile valleys between the ranges and belts of rich soil along the coast. The climate is moist and warm, but healthy. Aloes and dragon's blood are the chief commercial products. The inhabitants, about 10,000 in all, live on dates and the produce of their sheep, goats and cows. They belong to two distinct types—one with a comparatively light-colored skin and straight hair, the other darker with curly hair. But all alike speak the same peculiar language, which has certain affinities with the South Arabian dialect of Mahra. The people show traces of intermixture with Negro, Arab, and Indian tribes; and in ancient times the inhabitants of Socotra were believed to have been acquainted with Greek civilization and later to have been Nestorian Christians. From the 16th century at least they owed some sort of allegiance to the Sultan of Keshin on the Arabian coast. After being occupied by Great Britain in 1835-1839, the island was taken under British protection in 1876 and formally annexed in 1886. Population about ten thousand.

SOCRATES, a great Athenian philosopher, the son of Sophroniscus and Phænarete; born near Athens in 469 B. C. He was brought up to his father's calling, that of a sculptor, and for a time gained his living by it. He was, however, naturally an eager student, and by means of the best teachers and the best works accessible to him got the best education his country and his age could give him. He was one of the disciples of the great Anaxagoras and of his successor Archelaus, and soon gave himself up entirely



SOCRATES

to philosophy. He led an active social life, married—unhappily for himself, Xantippe—served his country as a soldier, distinguished himself by his courage and extraordinary endurance at the siege of Potidæa, at the battle of Delium, and at Amphipolis. At Potidæa he saved the life of his pupil Alcibiades, and at Delium the life of his pupil Xenophon. His robust constitution made him indifferent to the extremes of temperature; he could dress alike and go barefoot all the year round. He seems to have inclined rather to the aristocratic than the democratic party. Critias, one of the Thirty Tyrants, had been his pupil; Theramenes was his friend; so was Charmides. Yet he fearlessly rebuked Critias for his vices, and thereby made him his enemy; and he with equal courage and disregard of consequences denounced the proceedings of the Thirty, and in one important case refused to obey their command. On the trial of the six generals after the battle of Arginusæ he firmly opposed the injustice of the sentence.

It was, however, as a teacher that Socrates made himself the foremost man of Athens. He wrote no book, he did not establish a school or constitute a system of philosophy. But he almost lived abroad, and mixed with men familiarly. He talked and questioned and discussed, not for pay, but from the love of truth, and a sense of duty. He was persuaded that he had a high religious mission to fulfil, and that a divine voice (afterward spoken of as his *Dæmon* or *Genius*), habitually interfered to restrain him from certain actions. Socrates was distinguished chiefly by his theory of virtue. Virtue, he said, consisted in knowledge. To do right was the only road to happiness; and as every man sought to be happy, vice could arise only from ignorance or mistake as to the means; hence the proper corrective was an enlarged teaching of the consequences of actions.

So early as 424 B. C. he was attacked by Aristophanes, in his comedy of the "Clouds" as the arch-sophist, the enemy of religion, and corrupter of youth; substantially the same charges as those on which he was prosecuted 20 years later. He was made to appear not only hateful but ridiculous—a result the more easy to be attained because of his singularly ugly physiognomy, so easily rendered by the comic mask. He was persecuted during the tyranny of the Thirty, and after their fall he was impeached by Anytus, one of their leading opponents, with whom were associated Melitus, a tragic poet, and Lycon, an orator. He was charged with not believing in the gods which the state worshiped; with introducing new divinities; and with corrupting the youth. Death was proposed as the penalty. Socrates refused to make use of a speech prepared for his defense by Lysias, and defended himself in a tone of confident innocence which aggravated the ill-will of his judges. He was condemned by a majority of six only; but his additional speech in mitigation of the sentence raised the majority against him to 80. Thirty days elapsed between his sentence and its execution. During that period Socrates had the society of his friends and conversed with them as usual; the last conversation being on the immortality of the soul. He refused the offer of some of his friends to procure means of escape for him; drank the hemlock cup with perfect composure, and so died in the 70th year of his age in 399 B. C.

Socrates opened a new era in philosophy, and without founding a system he originated, by rousing men to reflection

and leading them toward self-knowledge, a vast movement of intellect which produced, first Platonism and the Aristotelian logic, and then all the systems, even conflicting ones, which rose into more or less importance during 10 successive centuries. By his religious spirit, his belief in God and in immortality, his aim to reunite religion and immortality, and his own noble and beautiful life, he exerted so strong and wholesome an influence that the historian of the Christian religion, Neander, does not hesitate to say that Socrates, like John the Baptist, was a forerunner of Christ. Our primary authorities for the life and teaching of Socrates are Xenophon's "Memorabilia and Apology of Socrates," and Plato's "Dialogues," in which he forms the great central figure.

SODA, the protoxide of the alkaline metal sodium. It may be procured in an anhydrous state by burning the metal in dry air or oxygen. It is of a white color, greedily abstracting water from the air, which cannot be expelled by heat. In this state it forms hydrate of soda, or caustic soda. It is so similar in its properties to hydrate of potash that it need not be fully described here.

Carbonates of Soda.—There are three of these, the ordinary monocarbonate, or common washing soda, Na_2CO_3, which in its crystalline form contains 10 equivalents of water; the sesquicarbonate, $Na_2CO_3+2NaHCO_3+3Aq$, which occurs in the mineral kingdom as trona and urao; and the bicarbonate, $NaHCO_3$, which is prepared by passing carbonic acid through a concentrated solution of the carbonate till saturation takes place. It is also prepared by exposing the crystallized monocarbonate to the action of a current of carbonic acid; but in this method of making it only the outside portions of the converted crystals should be used, the inner parts being only partially changed. It is ground and dried at a very gentle heat, care being taken to avoid a high temperature, which would cause the formation of the sesquicarbonate. Bicarbonate of soda crystallizes in prisms. It occurs in commerce as a white crystalline powder, which is gradually converted into the sesquicarbonate by exposure to the air. It is much used in medicine. The properties of the monocarbonate are described under manufacture of soda.

SODIUM, the alkaline metal of which soda is the oxide. It was discovered in 1807 by Sir Humphry Davy. It occurs in large quantities in nature, chiefly in combination with chlorine, as sea salt.

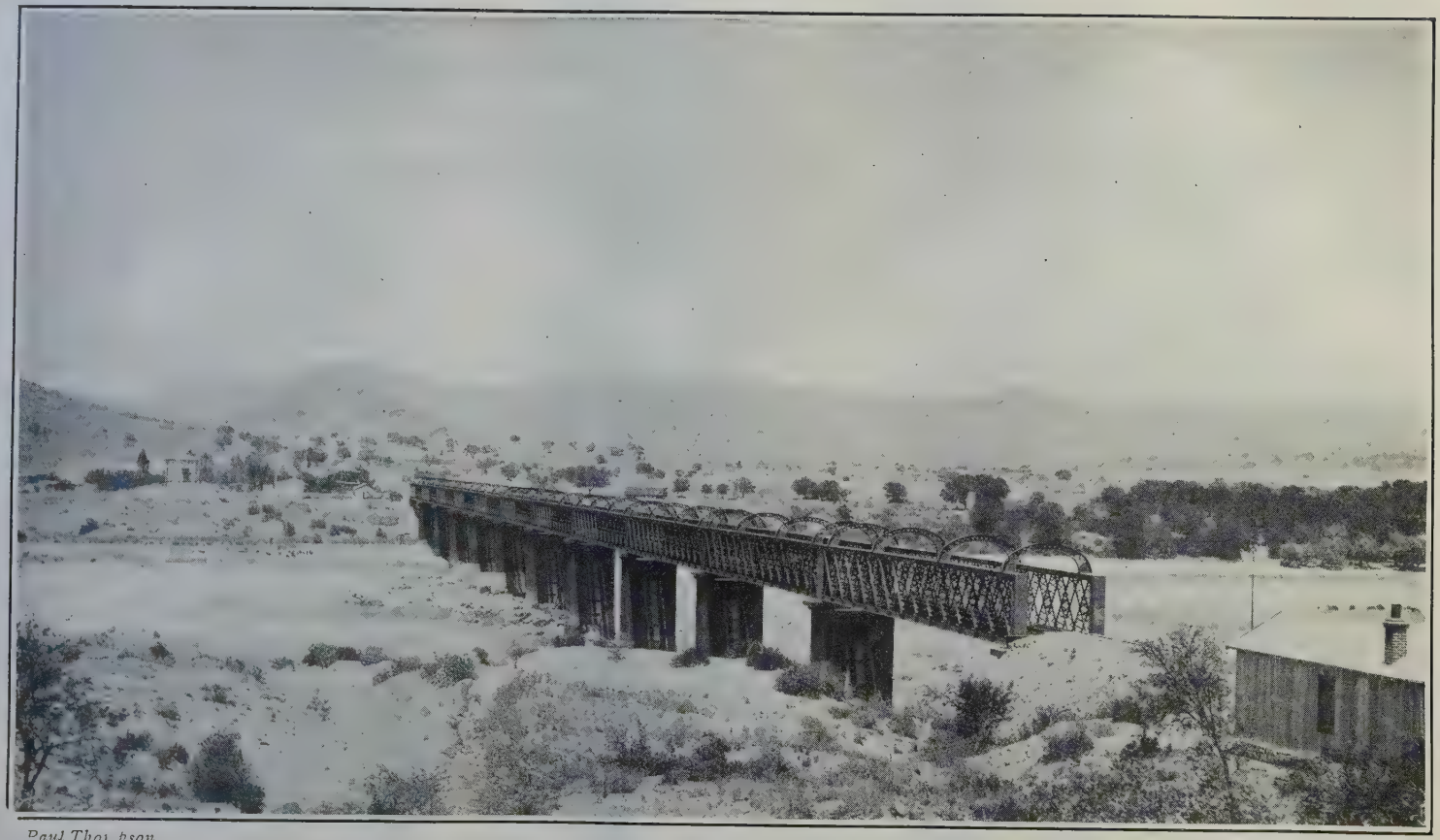
SODOM, one of the cities of the plain, and for some time the dwelling-place of Lot. Its crimes and vices (the nature of which is recalled in the word sodomy) were so enormous that God destroyed it by fire from heaven, with three neighboring cities, Gomorrah, Zeboim, and Admah, which were as wicked as itself.

SOEST, a town of the province of Westfalen, Prussia; 34 miles S. E. of Munster; was once a Hanse town, and one of the most important places in Germany, with a population of between 30,000 and 40,000, but has declined since the Thirty Years' War. Its city law was the model for that of many other cities, such as Hamburg, Lübeck, etc. The remains of its walls with their 36 towers are still to be seen. It has a great number of old churches, of which seven are now in use, the cathedral being Catholic and the remaining six Protestant. Soest is the center of a rich agricultural district, and has chemical works and extensive breweries. Pop. about 20,000.

SOFIA, or SOPHIA, capital of the kingdom of Bulgaria; lies in a fertile plain on the upper waters of the Isker, an affluent of the Danube, to the N. of the Vitsch Mountains, 75 miles N. W. of Philippopolis. The seat of a Greek metropolitan and a Roman Catholic bishop, it has many mosques, minarets, Christian churches, synagogues, etc. Sofia is the converging point of several important trade routes (three from the Balkans), and carries on considerable manufactures of cloth, silk wares, leather, and tobacco. In the vicinity are celebrated hot springs, with a temperature of 48° C. Sofia occupies the site of old Sardica, which was built by Justinian. It was taken from the Byzantine emperor Basilius in 809 by the Bulgarians, who called it Triaditza, a name which gave place at the time of the Crusades to that of Stralitz or Sternitz. It fell to the Turks in 1382. During the Russo-Turkish War of 1877-1878 the abandonment of Sofia became necessary as soon as a considerable Russian force had made its way S. of the Balkans, and the retreat was effected without loss. At the Congress of Berlin (July, 1878), the English plenipotentiaries strove to join the town and district of Sofia to the province of Eastern Rumelia, but they were eventually included in Bulgaria. On Oct. 25, 1878, Sofia became the seat of government of Bulgaria. Pop. about 105,000.

SOFISM, or SUFISM, the mystical and pantheistic doctrines of the Sofis. They consider that God alone exists; that He is in all nature, and that all nature is in Him, the visible universe being an emanation from His essence. God is the real author of the deeds of men, and there is

THE CECIL RHODES MEMORIAL, NEAR CAPETOWN, SOUTH AFRICA. THE FIGURE ON HORSEBACK REPRESENTS ENERGY



Paul Thompson

NORVAL'S BRIDGE, WHERE ONE CROSSES FROM CAPE COLONY INTO ORANGE FREE STATE

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LION'S HEAD, CAPETOWN, SOUTH AFRICA

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THE NATIONAL HALL OF CONGRESS, SANTIAGO, CHILE

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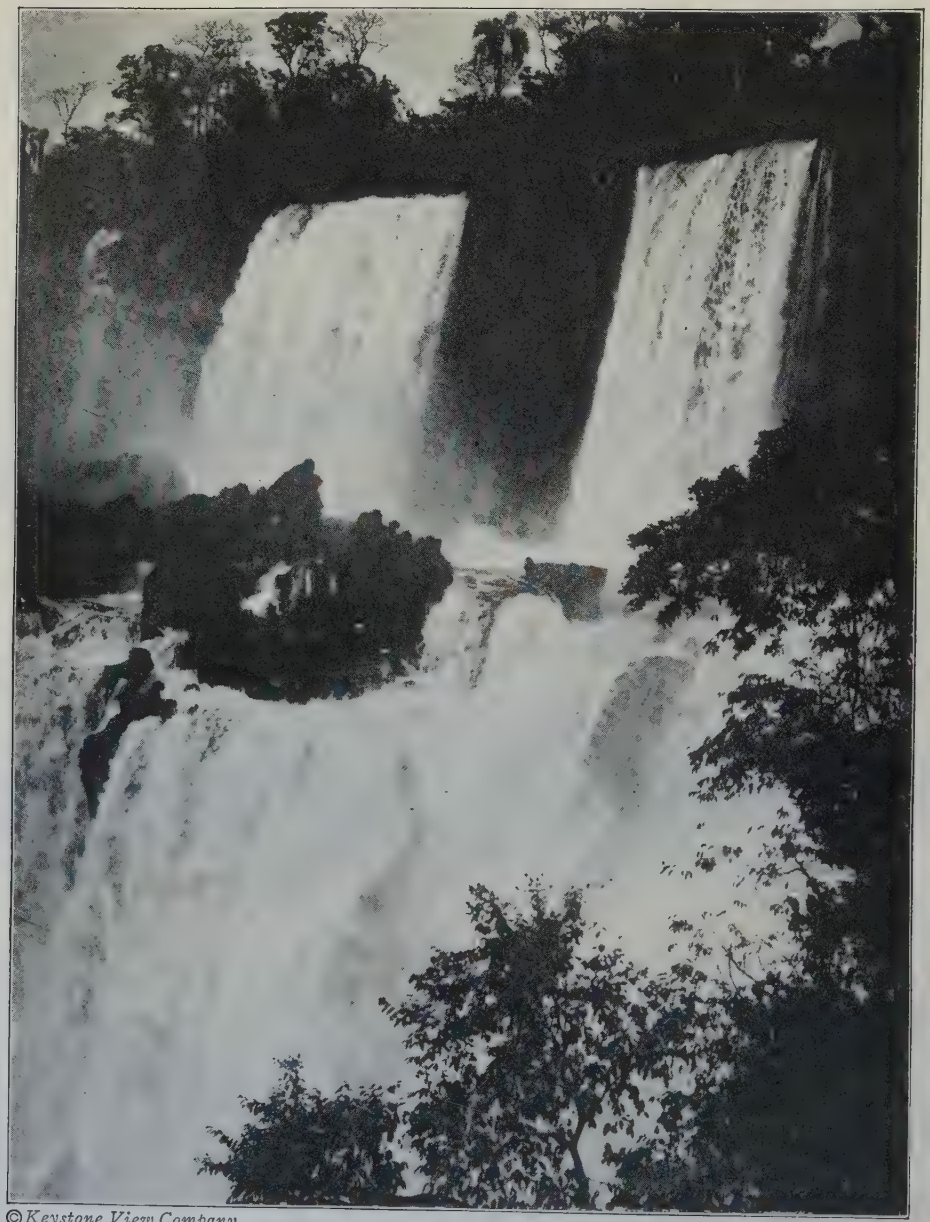
CATHEDRAL PLAZA IN SANTIAGO, CHILE



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IGUAZU WATERFALLS, IN THE INTERIOR OF SOUTH AMERICA

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THE MONROE PALACE, ONE OF THE MOST BEAUTIFUL BUILDINGS IN RIO DE JANEIRO

©*International Film Service*

A COCOANUT FESTIVAL HELD BY THE NATIVES OF THE SOLOMON ISLANDS IN THE SOUTH PACIFIC

therefore no valid distinction between good and evil. The passages in the Koran which speak of a paradise and a hell are only allegorical. Man's soul existed before his body, and will transmigrate when he dies into other bodies till sufficiently purified to be absorbed into the deity.

SOGNEFJORD, an extensive fjord on the W. coast of Norway, exhibiting magnificent rock and glacier scenery.

SOIL, that part of the disintegrated surface of the earth's crust in which the roots of plants ramify, and from which growing plants derive the mineral substances necessary for their proper development. Soils are formed by the disintegration of the rocks through the continued action of water and air at various temperatures, and by the accumulation of the decaying remains of vegetable organisms. In the process of disintegration water acts variously, as in the bursting action of frost, the gradual wear of running water, and the sawing, grinding, and dashing of the glacier and mountain torrent. The action of the atmosphere is dependent upon the carbonic acid which it contains. This acid is capable of decomposing the silicates of potash and soda, which form part of rocks, seizing the potash and soda and converting the same into carbonates, which are subsequently washed out by water. Besides carbonic acid, chloride of sodium, or common salt, possesses a very powerful solvent action, having in solution the power of dissolving the phosphates of the alkaline earths. The tendency of water and atmosphere combined is to level the earth's surface by destroying eminences and filling up hollows. We often find, therefore, in the plains a soil differing widely from its underlying stratum, on account of its being a mixture of the deposits of streams and the débris of neighboring or more distant mountains. On hills the soil is usually of the same nature as the subsoil.

The proportion of organic matter varies exceedingly in different soils. The mixture of various earths and humus, termed loams, constitute the best of soils. These are classified according to the earths which prevail in them, as a sandy loam, etc.; according to their degree of friability, as a free loam, a stiff loam, etc.; or according to both, as a free calcareous loam, etc. They are generally laid on the sides of valleys, along the bases of hills or mountains, or on the banks of upland rivers. In general, much more depends on the texture of a soil, and on its capacity for retaining or parting with water and heat, than on its chemical composition.

SOISSONS, a town and fortress of France, in the department of Aisne; on the Aisne river; 65 miles N. E. of Paris. It is the key of Paris for an army invading France from the Netherlands, and is the meeting point of several military roads. The principal building is the cathedral, founded in the 12th century, the library of which contains many rare MSS. There are also some remains of the great castellated abbey of St. Jean des Vignes (1076), where Thomas à Becket found refuge when in exile. The church of St. Peter (Romanesque) dates from the 12th century; there are slight remains of the once celebrated abbey of Notre Dame (founded 660) and of the abbey church of St. Léger (1139). Quite near to Soissons is an institution for deaf and dumb, which occupies the site of the famous abbey (560) of St. Médard, where Clothaire and Siegbert were buried. The civil buildings embrace a college and a museum of antiquities. Soissons is one of the oldest towns in France, and was celebrated even in the time of the Romans, when it bore the name first of Noviodunum, and afterward of Augusta Suessionum; hence its modern name of Soissons. It was the second capital of Gallia Belgica, and subsequently the most important town of the Romans in northern Gaul. Near to it Clovis overthrew Syagrius, the Roman commander, in 486. The same prince made Soissons the seat of the Frankish monarchy of Neustria. Here Pepin was crowned king, and Louis the Pious imprisoned. It was the gathering place of more than one important council and has been repeatedly captured and sacked in war—*e. g.*, six times during the Hundred Years' War, by the Armagnac party in 1414, by Charles V. (1544), the Huguenots (1565), three times in 1814, and by the Germans in 1870. The town suffered severely in the WORLD WAR (*q. v.*). It was captured by the Germans, and was retaken by the French on Aug. 2, 1918. Pop. about 14,300.

SOKOTO, or **SACKATOO**, a large town in Central Africa, on the Sokoto or Rima river, which falls into the Niger. It is surrounded by lofty walls, is fairly well built, and has regular streets, a royal residence, several mosques, manufactures of cotton cloth, and carries on an extensive trade. Pop. at one time given at 80,000. The same name belongs to an extensive Fellata Kingdom, of which the town was formerly the capital, though Wurno has now that rank; area, over 100,000 square miles.

SOLAR CYCLE, in chronology, a term applied to one of those artificial periods made use of in chronological researches. It comprehends a period of 28 years, compounded of 7 and 4, the number of days in a week, and the number of years in the

interval of two leap years. This cycle remained undisturbed till the end of the 19th century; but in consequence of the year 1900 not being reckoned as a leap year, the whole cycle was then overthrown. It may, however, be reconstructed after 2000, that year being reckoned as leap year; it will then last till 2100.

SOLAR SYSTEM, the sun and all the bodies, by whatever name they may be called, which periodically revolve round the sun as a center. Visible to us are seven distinct orders or systems of revolving worlds. They are the zodiacal light, whatever that may be, the planetary, the satellitic, the meteoric, the cometary, the stellar, and the nebular systems. All but the latter two belong to our solar system. The limits of the planetary system, as far as known, are Mercury, the nearest to the sun, and Neptune, the most distant. This limit does not include the hypothetical intra-Mercurial planets, discovered during the total solar eclipses, in 1878, by Watson and Swift. Its cometary extent is not known, and never will be, as several comets have computed periods of over 1,000,000 years, and even their aphelia reach only a step toward even the nearest star. The sun's far-reaching power, of course, extends to half way to the stars, and it is not an unreasonable supposition to suppose that there are comets whose aphelia extend that far, and if so, their periodic times must be several million years.

The bodies as far as known that are denizens of our solar system are the sun (the center), the planets of Mercury, Venus, earth with one satellite, Mars with 2 satellites, 428 asteroids, Jupiter and 5 satellites, Saturn with 5 rings and 8 satellites, Uranus with 4, and Neptune with 1, also Halley's, Pons', and Olbers' comets of long period, and about 25 of short period, ranging from 3.3 years (Encke's) to 13.78 years, commonly, but unjustly, called Tuttle's comet. It was discovered by Méchain in 1790. To the list must be added 200 or more meteoric rings, which, while the earth is passing through them, produce the star showers. Every member of the solar system, be it planet, satellite, meteoroid or comet, moves in an orbit called an ellipse, of greater or lesser eccentricity. There is not a heavenly body known to man that moves in a circle. The planets and satellites revolve in elliptic orbits, while the comets move some in elliptic and others in parabolic and hyperbolic orbits. Those moving in either of the latter two can never return, as the two branches of their paths do not meet to form a closed curve as does the ellipse. For adopting the ellipse instead of the circle for planetary revolution the world is indebted to the genius of Kepler, who by the first of his three laws brought harmony out of confusion. The three laws of Kepler, as enunciated by him, are: (1) The planets move in ellipses, having the sun in one of the foci. (2) The radius vector of each planet describes equal areas in equal times. (3) The squares of their periodic times are proportional to the cubes of their mean distances from the sun. As all heavenly bodies hang suspended on nothing throughout all space, each being attracted by all the others, it results that they must move, and, while the motions of the planets are easily noticeable in a few hours, and even minutes, it requires to detect motion in the stars long-continued observation with instruments of great delicacy and power to ascertain that they have any motion at all, so far away are they. No planet whose orbit is interior to the earth's can ever assume the crescent phase, or rise when the sun sets, or be on the meridian at midnight, or transit the sun. On the other hand, those whose orbits are exterior to ours can never assume the crescent and half-moon phase, and are the only ones that can ever be in opposition, rising at sunset.

PRINCIPAL ELEMENTS OF THE SOLAR SYSTEM

Planet	Diameter (miles)	Density (earth's 1)	Mass (earth's 1)	Mean distance from sun (millions of miles)	Period of revolution (days)
Mercury	2,770	0.56	0.024	35.7	88
Venus	7,700	0.82	0.82	67.2	225
Earth	7,918	1.00	1	92.9	365
Planetoid Eros	20	?	?	135.1	643
Mars	4,230	0.71	0.105	141.5	687
Planetoid Ceres	480	?	?	257.1	1,681
Jupiter	86,500	0.24	318	483.3	4,333
Saturn	73,000	0.13	93	886.0	10,759
Uranus	31,900	0.22	15	1,781.9	30,688
Neptune	34,800	0.20	17	2,791.6	60,181

SOLBERG, THORVALD, an American public official, born at Manitowoc, Wis., in 1852. He served on the staff of the Library of Congress from 1876 to 1889

and became register of copyrights in 1897. He took an active part in the effort to secure international copyright and attended the various international copyright congresses, being the official delegate of the United States to the congresses at Paris, Berlin, and Luxembourg. Besides having contributed to many American and foreign journals, he wrote: "Annual Reports Copyright Business" (1897-98, 1916-19); "Copyright Enactments, 1883-1906" (1906); "Copyright in England" (1902); "Copyright in Canada and Newfoundland" (1903); "Report on Copyright Legislation" (1904); "Foreign Copyright Laws" (1904); "Copyright in Congress—Bibliography and Chronological Record" (1905); "Memorandum Draft of a Bill to Amend and Consolidate the Acts Respecting Copyright" (1905-6); "International Copyright Union—Report on the Berlin Conference of 1908"; "Report on Copyright Relations with South American Republics" (1915).

SOLDIERS' HOMES, institutions provided by National and State governments for the care of sick and disabled soldiers and sailors. The National Home for Disabled Volunteer Soldiers has branches at Dayton, Ohio; Milwaukee, Wis.; Togus, Me.; Hampton, Va.; Leavenworth, Kan.; Santa Monica, Cal.; Marion, Ind.; Danville, Ill.; Johnson City, Tenn.; and Hot Springs, S. Dak. The aggregate number of inmates in 1919 was about 25,000. The chief requirements for admission are: (1) An honorable discharge from the United States service. (2) Disability which prevents the applicant from earning his living by labor. (3) A soldier or sailor must forward with his application for admission his discharge paper, and when he is a pensioner, his pension certificate, and if he has been a member of a State Home, his discharge from that Home, before his application will be considered. Those who have been members of the State Homes must have been discharged from those Homes at least six months before they can be admitted to a branch of the National Home, except by a vote of the Board of Managers. Applicants are requested to conform strictly to the above requirements.

SOLENT, that part of the British Channel separating the N. W. shore of the Isle of Wight from the mainland of Hampshire, and extending between the Needles and West Cowes. It has a width varying from 2 to 5 miles, and affords a safe and well-sheltered roadstead.

SOLEURE, or **SOLOTHURN**, a canton in the N. of Switzerland; bounded on the W. and S. by Berne, and on the N. and E. by Basel and Aargau; area, 302 square miles; pop. (1920) 130,230, mostly Roman Catholics and speakers of German. The greater portion of the canton is fertile and well cultivated, especially in the valley of the Aar. But it also embraces outlying ranges of the Alpine and Jura systems. Besides grain, the principal products are fruit, timber, cherry brandy, cheese; cotton, paper, iron, hose, watches, clocks, etc. The canton consists of the territories acquired by the town of Soleure.

Soleure, or Solothurn, the capital of the canton, is situated on both sides of the Aar, 18 miles N. N. E. of Berne. The most notable building is the cathedral of St. Ursus, built in 1762-1763 on the site of an older church (1050), with a cupola and façade of Corinthian columns. There are also a curious old clock tower, an arsenal with a museum of ancient trophies of war, and collections of antiquities. The principal objects of industry are cotton, watches, clocks, and cement. Pop. (1920) 12,970. Soleure (Salodurum) was a place of some consequence in Roman times, was made a free city of the empire (1218), joined the Swiss Confederation in 1481, and in 1828 was chosen the bishop's see for the diocese of Basel. Close by are the baths of Weissenstein, with a celebrated "whey cure" that is very much frequented.

SOLFERINO, a village and commune of Italy, in the province and 18 miles N. W. of Mantua. In 1796 the Austrians were here defeated by the French prior to the siege of Mantua; it was here also, June 24, 1859, that a battle was fought between the French and Sardinians on the one side and the Austrians on the other, resulting in the defeat of the latter and the subsequent treaty of Villafranca.

SOLINGEN, a town of Prussia; 13 miles E. of Düsseldorf and not far from the river Wupper. Ever since the 12th or 13th century it has been famous for its steel and iron ware, especially for sword blades, helmets, cuirasses, knives, scissors, surgical instruments, etc., which, before the World War, were exported to all parts of the world. Solingen has also iron foundries, cigar factories, etc. Pop. about 50,000.

SOLITAIRE, a game played by one person on a board indented with 33 or 37 hemispherical hollows, with an equal number of balls. One ball is removed from the board, and the empty hollow thus left enables pieces to be captured singly as in draughts. The object of the player is to take all the pieces except one without moving diagonally or over more than two spaces at a time. The game

may also be played with ordinary playing cards, the object being to so combine the cards that similar denominations may be grouped. There are many variations, some of them extremely intricate.

SOLOMON (Hebrew, Shelomoh, the Prince of Peace), son of David, King of Israel, by Bathsheba, formerly the wife of Uriah, was appointed by David to be his successor in preference to his elder brothers. By his remarkable judicial decisions and his completion of the political institutions of David Solomon gained the respect and admiration of his people; while by the building of the temple, which gave to the Hebrew worship a magnificence it had not hitherto possessed, he bound the nation more strongly to his throne. The wealth of Solomon, accumulated by a prudent use of the treasures inherited from his father; by successful commerce; by a careful administration of the royal revenues; and by an increase of taxes, enabled him to meet the expenses of erecting the temple, building palaces, cities, and fortifications, and of supporting the extravagance of a luxurious court. Fortune long seemed to favor this great king; and Israel, in the fulness of its prosperity, scarcely perceived that he was continually becoming more despotic. Contrary to the laws of Moses, he admitted foreign women to his harem; and from love of them he was weak enough in his old age to permit the free practice of their idolatrous worship and even to take part in it himself. Toward the close of his reign troubles arose in consequence of these delinquencies, and the growing discontent, coming to a head after his death, resulted in the division of the kingdom, which his feeble son Rehoboam could not prevent. The 40 years' reign of Solomon is still celebrated among the Jews, for its splendor and its happy tranquillity, as one of the brightest periods of their history. The writings attributed to Solomon are "The Book of Proverbs," "Ecclesiastes," and the "Song of Solomon," with the apocryphal book the "Wisdom of Solomon"; but modern criticism has decided that only a portion of the "Book of Proverbs" can be referred to Solomon.

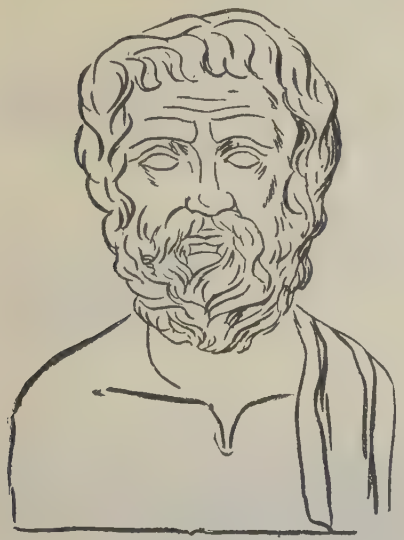
SOLOMON ISLANDS, a group in the South Pacific; lying S. E. of New Britain and E. of New Guinea; extending in a S. E. direction between lat. 5° and 11° S., and long. 154° to 162° E. These islands were first discovered and explored by the Spanish navigator Mendana in 1568. He named them Solomon Islands on the imagined idea that the riches of Solomon's temple had been brought from them. While on his way to colonize them in 1595, he died, and the islands were not again visited till they were rediscovered by Carteret in 1767. They were visited several times during the latter part of the 18th century, and parts of the coast line of the larger islands were surveyed, but between 1794 and 1838, they became almost forgotten. After the latter date the survey of the coast was renewed, and both traders and missionaries endeavored to settle on the islands. Neither met with much success, however, and little was heard of the islanders save accounts of the murders and plunders perpetrated by them. In 1845 some French missionaries went thither in charge of Mgr. Epaulle, a notable dignitary of the Church, but their leader was killed by the natives soon after landing. There is no doubt, from the accounts given, that the natives practiced cannibalism. In 1848 the French mission was abandoned. Some 12 or 14 years later, the English Church established a mission on the islands, in charge of native teachers from other islands that had been Christianized. In 1881 the French Catholic mission was again resumed.

The British protectorate was extended in 1887-1898. In accordance with the Anglo-German agreement of 1899 the islands of Choiseul and Isabel, with their surrounding islets, were transferred to Great Britain, Germany retaining the islands of Bougainville and Buka until the World War, when they were captured by an Australian force in 1914. The population of the entire group of islands is about 600 whites and 150,000 natives.

SOLOMON'S SONG, called also the SONG OF SONGS, or CANTICLES, one of the canonical books of the Old Testament.

SOLON, one of the seven sages of Greece, and the celebrated legislator of Athens; born in Salamis, in the 7th century B. C. After having enhanced the glory of his country by recovering Salamis, he was chosen archon 594 B. C., and having received full power to do whatever he judged needful, he set himself to the task of improving the condition of his countrymen. He abolished most of the cruel laws of Draco, and formed a new constitution founded on the principle of making property, not birth, the title to the honors and offices of the State. He made many special laws also relating to trade and commerce, marriage, disposition of property by will, etc., caused them to be engraved on wooden cylinders, and is said to have bound the Athenians by an oath not to make any changes in his code for 10 years. He then left the country, to avoid being obliged to make any alteration in them, and visited Egypt,

Cyprus, and Lydia. On his return, after an absence of 10 years, he found the State torn by party violence, and his kinsman



SOLON

Pisistratus aiming at the sovereignty, which he soon seized. Solon then withdrew from public life and is supposed to have died at the age of 80, about 558 B. C.

SOLSTICE, in astronomy, the time when the sun is in one of the solstitial points—that is, when it is at its greatest distance from the equator—and is so called because he then appears to stand still, and not to change his distance from the equator for some time. There are two solstices in each year—the summer and the winter solstice. The former is when the sun seems to enter the tropic of Cancer, which is on June 21, the longest day; the latter solstice is when the sun enters the first degree, or seems to describe the tropic of Capricorn, which is on Dec. 22, the shortest day. This is only to be understood of the Northern Hemisphere, as in the Southern the sun's entrance into Capricorn makes the summer solstice, and into Cancer the winter solstice.

SOLUTION, in ordinary language, the act of separating the parts of any body; disruption, breach; also, the act of solving, explaining, answering, or clearing up, as a problem, question, doubt; the state of being solved, explained, answered, or cleared up; or, that which serves to solve, explain, answer, or clear up a problem, question, doubt, or the like, explanation, resolution.

In chemistry, a term applied to the product of the action, as well as the action itself, whereby a solid or gaseous body in contact with a liquid suffers liquefaction; or to the union of one liquid with another when each is capable of taking up only a limited quantity of the other.

SOLVAY, a city of New York, in Onondaga co. It is on the Delaware, Lackawanna, and Western, and the New York Central and Hudson River railroads, and on the State Barge Canal. It joins Syracuse on the west. Its chief industries are the manufacture of chemicals, pottery, and iron. The city has a public library and a high school building. Pop. (1910) 5,139; (1920) 7,352.

SOLVAY, ERNEST, a Belgian chemist, born in 1838. His chief investigations were connected with the development of the ammonia process for the manufacture of soda and its establishment on a commercial basis. He erected his first plant in Belgium in 1863. His processes were continually improved and patents covering it were granted. He established plants in all parts of the world and by 1913 practically had acquired control of the world's supply of soda. He founded the Solvay Institute in Brussels for the advancement of social democracy, and was also active in philanthropic work. He made large gifts to educational institutions in Paris and in Belgium, and was president of the Belgian Academy of Letters. During the World War he took an active part in relieving the distress of Belgium, although the greater part of his fortune was taken by the Germans during their occupation of Belgium.

SOLWAY FIRTH, an arm of the Irish Sea, forming part of the boundary between England and Scotland, and extending inland in a N. E. direction for above 41 miles, with a breadth diminishing from 20 miles, at its entrance between St. Bees Head in Cumberland, and Rayberry Head in Kirkcudbrightshire, to 7 miles, and finally only to 2 miles. A large portion of the Solway is left dry at ebb tide. It abounds with fish and has valuable salmon fisheries.

SOLYMAN I., or **SULEIMAN**, the NOBLE, Emperor of Turkey, was proclaimed emperor after the defeat and capture of his father, Bajazet, by Timour, 1402. He was dethroned by his brother, Mousa, during a revolt of his subjects, and soon after killed, 1410.

SOLYMAN II. surnamed the MAGNIFICENT; born in 1493, succeeded his father, Selem I., in 1520. Having concluded a truce with Ismael, sophi of Persia, and quelled a rebellion in Syria, he turned

his arms against Europe. In 1521 he took Belgrade; and in the following year Rhodes fell into his hands after an obstinate defense. In 1529 he made himself master of Buda, and then laid siege to Vienna, whence he was obliged to retreat with the loss of 120,000 men. In 1534 he marched into the East, and took Tauris from the Persians, but was soon afterward defeated by the Shah. His forces were also repulsed before Malta; but he took the Isle of Chios in 1566. He was a poet, legislator, and warrior of eminent greatness for an Oriental. He encouraged arts and literature, made roads, bridges, erected noble mosques and public buildings, and superintended the compilation of an administrative code. He died in Szigeth, Hungary, in 1566.

SOLYMAN III., became sultan on the deposition of his brother, Mahomet IV., in 1687. His life had been spent up to his 49th year, in the seraglio, where he had devoted himself to the study of the Koran. Under his weak rule the Turks were defeated in Hungary and in Servia. He died in Constantinople in 1691.

SOMALILAND, a country S. E. of Abyssinia on the coast of the Gulf of Aden and the Indian Ocean, apportioned to Great Britain, France, and Italy. Two ranges of mountains traverse the peninsula S. E. to N. W., between which lies the Wadi Nogal, of which the natives speak in the most glowing terms. Several varieties of gum trees occur, and the mimosa, tamarisk, wild fig, and several species of the cactus and aloe are abundant. The wild beasts include the elephant, lion, leopard, hyena, wolf, and jackal. Several varieties of deer, jerboas, and squirrels are common. The Somâli are a fine race, mainly Mohammedans, though still in a barbarous state. The principal articles of trade or produce are myrrh, ivory, ostrich feathers, hides and horns, coffee, indigo, and gum arabic. A strip 180 miles broad on the coast was reserved to Italy by the treaty of Adis Abeba. By the Cairo convention, signed Jan. 19, 1899, the ports of Berbera and Zilah with the adjacent strip on the N. coast now belong to Great Britain. In 1898 Great Britain ceded to Abyssinia a part of Somaliland. See ABYSSINIA.

SOMALILAND PROTECTORATE, a British protectorate in Africa. It is on the Gulf of Aden and is bounded inland by Italian territory. The area is 68,000 square miles. The natives lead a nomad existence and engage in cattle-raising, and in the coastal towns there is much commerce, with exports of hides and skins, cattle and sheep, gold, salt, ivory, and gums. Cotton piece-goods, rice, dates, shirtings and sugar are largely imported. The ports are Zeila, Bulhar, and Berbera. It formerly belonged to Abyssinia, but in 1884 the British succeeded in gaining a footing, and it has since been administered by a commissioner, with officials in the coast towns. Pop. about 375,000.

SOMBRERETE, a town of Mexico, State of Zacatecas, 85 miles N. W. of the town of that name, is the center of a rich silver mining district. Pop. about 11,000.

SOMBRERO ISLAND, a small rocky British island midway between Anguilla and the Virgin group, West Indies. It has a lighthouse. There are large deposits of phosphates of lime.

SOMERSET, LADY HENRY (ISABEL), an English social worker, born in 1850, the eldest daughter of the third Earl Somers. In 1873 she married Lord Henry Somerset. She became interested in temperance reform, and in 1895 she founded an industrial farm colony for inebriate women at Duxhurst. It was the first institution of its kind in England. She also established a home for training workhouse children, and other philanthropic organizations. She was for a number of years president of the National British Women's Temperance Association and of the World's Women's Temperance Union. She made several visits to the United States.

SOMERSETSHIRE, a county of S. W. England, forming parts of the S. and E. shores of the Bristol Channel. Area, 1,615 square miles. Pop. about 425,000. The surface of the county is diversified. There are lofty hills, rich valleys, barren moors, and vast stretches of marsh lands, much of the latter being below high water and protected by sea banks and sluices. The wild district of Exmoor in the western part of the county, is well known. The principal river is the Bristol Avon. The principal agricultural products are wheat and barley, the quality of which is especially famous in the neighborhood of Bridgewater. Cattle-breeding is also carried on extensively, and the dairy products of the county, especially cheddar cheese, have been noted for a long time. The rich mineral products, consisting chiefly of iron, are not worked extensively. The principal manufactures are woolens, coarse linens, gloves, silk, and lace. Capital, Taunton (pop. about 23,000).

SOMERSWORTH, a city of New Hampshire, in Strafford co. It is on the Salmon Falls river, and on the Boston and Maine railroad. It is important for its manufactories of textiles and dyes. It has a public library and a municipal

theater. Pop. (1910) 6,704; (1920) 6,688.

SOMERVILLE, a borough of New Jersey, the county-seat of Somerset co. It is on the Raritan river and on the Central Railroad of New Jersey. It is chiefly a residential place but has manufactures of woolen cloth, clothing, stoves, iron pipe, etc. Pop. (1910) 5,060; (1920) 6,718.

SOMERVILLE, a city in Middlesex co., Mass.; on the Mystic river, and on the Boston and Maine railroad. It comprises nearly a dozen villages, and contains a public library, high schools, Home of the Little Sisters of the Poor, a hospital, street railroads, electric lights, National, savings, and co-operative banks, and several weekly newspapers. It has desk factories, iron foundries, flour mills, tube works, and large slaughtering and meat-packing plants. The city is built on seven hills, some of which were fortified during the Revolutionary War, and the remains of some of the structures are still preserved, including the "old powder house" on Quarry Hill. The city is a favorite residential suburb of Boston business men. Pop. (1910) 77,236; (1920) 93,091.

SOMME, a river of northern France, rising near Fonsomme, about 6 miles N. E. of St. Quentin, in the Department of Aisne. After flowing in a southwesterly direction, it turns N. W., enters the Department of Somme, and after receiving on the left the Avre and Celle, it enters the English Channel below St. Valéry. Its total course is about 152 miles long. The Somme Canal follows the course of the river from St. Simon to St. Valéry, a distance of about 97 miles. The river is also connected with the Scheldt by the St. Quentin Canal, and with the Oise by the Crozat Canal. The river became widely known during the World War as a result of the highly important fighting which at various times occurred along its upper reaches, some of the most important battles of the World War being known as the Battles of the Somme.

SOMME BATTLES. See PICARDY, BATTLES OF.

SOMNAMBULISM, literally, the act or practice of walking in sleep; but, in a wider and more usual sense, that state of sleep or unconsciousness in which the mind retains its power over the limbs, but has no influence over its own thoughts.

SONATA, a term originally applied to any kind of musical composition for instruments, as distinguished from vocal compositions, which were called cantatas. It is now, however, confined to compositions for solo instruments, generally the pianoforte. The term sonata or suonata, as applied to a musical composition, was first used about the beginning of the 17th century. Those of that time so called had but one movement; they were in fact simply airs arranged in parts for an instrument or instruments. A modern sonata is generally constructed upon the following plan: The first movement is an allegro, sometimes with an introduction, but more frequently without one; the second, "the slow movement," is set in any time, between adagio and andante; and the final movement is an allegro. See CONCERTO.

SONNET, a species of poetic composition first brought into notice by Petrarch, and consisting properly of 14 iambic verses of 11 syllables. It is divided into two chief parts, each consisting of two divisions—in the former, each comprising four lines (quatrain); in the latter, three (terzina). The quatrains have two rhymes, each of which is repeated four times; and in the common Italian form the rhymes are the first, fourth, fifth, and eighth verses, and the second, third, sixth, and seventh; but several other forms are also adopted. In the two terzine, there are either three rhymes each twice repeated, or two rhymes thrice repeated in all positions. The sonnet generally contains one principal idea pursued through the various antitheses of the different strophes, and adorned with the charm of rhyme. Italy and Spain are the countries in which the sonnet is most cultivated, the lightness and flexibility of their languages being eminently suited for such compositions.

SONNINO, SIDNEY, BARON, an Italian statesman, who, as Minister of Foreign Affairs, represented Italy at the Paris Peace Conference. He was born in 1847, and while still a young man served in diplomatic posts in Spain, France, and Austria. He was elected to Parliament at the age of 30, and attained prominence at once through his knowledge of economic and financial methods. He favored reforms in the land policy by which large estates should be broken up. From 1887 to 1890 he was Undersecretary for Finance, and again from 1893 to 1896. He was later Minister of the Treasury, and, while he held this office, put in effect many reform measures. Following the defeat of Crispi, he led the opposition in Parliament for about 10 years. During this period he was Prime Minister in 1906 and in 1910. He became Foreign Minister in November, 1914, and carried on the negotiations with Austria and Germany for the recognition of Italy's claims. He also negotiated the

Treaty of London, with England, France, and Russia. He took a conspicuous part in the Peace Conference, and made every effort to secure Italy's claims to Fiume and Dalmatia. Unable to secure the assent of the Conference, he left Paris and returned to Italy. Shortly after, the ministry of which he was a member, fell.

SONORA, a frontier State in the N. W. of Mexico; on the Gulf of California; is the second largest in the republic; area, 76,633 square miles. The coast is flat and sandy, the interior filled with wooded mountains and fertile valleys. Malaria is mostly confined to one part of the coast. Here the climate is hot, but in the mountains there is frost for five months in the year. The chief rivers are the Sonora, Yaqui, and Mayo. The principal wealth of the State is in its minerals, especially gold, silver, mercury, and iron. Agriculture, wine growing, and cattle-rearing are also successful, and cottons, hats, shoes, and soap are manufactured. Pop. about 275,000. Capital, Hermosillo; chief port, Guaymas.

SONS OF THE AMERICAN REVOLUTION, NATIONAL SOCIETY OF THE, a patriotic society. It was organized in New York City in 1889 and membership is hereditary, being confined to descendants of those who fought in the cause of American independence, as officer, soldier, seaman, marine, militiaman, or minuteman in the forces of the Continental Congress or of the several colonies. The society is a reorganization of the Sons of Revolutionary Sires, which was organized in San Francisco, Cal., in 1875, and after 1889 became the California State Society of the Sons of the American Revolution. The society was incorporated in 1906, and the membership is about 13,500.

SONS OF THE REVOLUTION, a patriotic society composed of the descendants of those who co-operated in the American Revolution. It was organized in New York City in 1876 and reorganized in 1883. Membership is restricted to male lineal descendants and the society has been active in marking with tablets and otherwise indicating and safe-guarding places associated with persons and events connected with the war of independence. Among the monuments due to the society are tablets commemorating the site of the battles of Long Island and of Harlem Heights. The statue of Nathan Hale in City Hall Park was erected by the society. Membership is about 7,000.

SONS OF VETERANS, a patriotic organization established in Philadelphia, Pa., in 1879. It is an hereditary society, being restricted to lineal male descendants of soldiers, sailors and marines who served with honor in the Civil War. The insignia consist of a bronze bar on which are the words "Filii Veteranorum"; and pendant from this bar is a red, white and blue ribbon attached to a medallion containing a monogram of the letters "S. V." in relief on a wreath over crossed cannons, surmounted by a spread eagle. A parallel society is the Daughters of Veterans, consisting of female descendants. The members number about 56,000.

SONS OF WAR VETERANS, SOCIETY OF, a patriotic society established in 1893, for the purpose of preserving and perpetuating the principles for which the Federal soldiers fought in the Civil War, to assist surviving veterans and their widows, and help in the mutual benefit and advancement of its members. The society admits to membership any male descendant of an honorably discharged Union soldier, sailor, or marine, who served for not less than six months and part of the time at the front.

SOPHIA, Empress of Constantinople, niece of Theodora, and wife of Justinian II., with whom she shared in the government of the state. After the death of that prince in 578 she conspired against Tiberius Constantine, who had been raised to the throne by her advice, and, being defeated by him, was compelled to live in privacy.

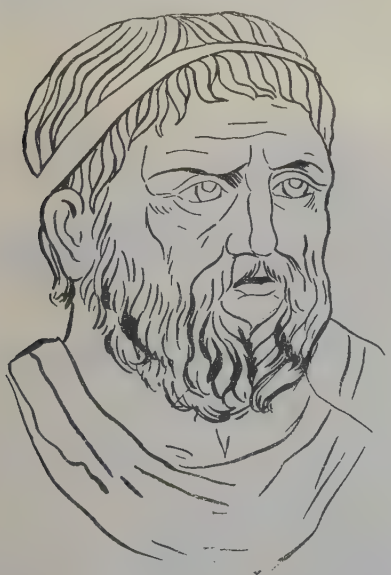
SOPHIA, half-sister of Peter the Great, and Czarina of Russia; born in 1657; in 1682 she placed herself at the head of the revolt of the *stryeltsy*. Having succeeded in her ambitious designs, she reigned over the Muscovites under the names of her brothers, Peter and Ivan. The former (Peter the Great), however, finally possessed himself of the sole power; and Sophia died a prisoner in a convent in 1704.

SOPHIA, CHURCH OF ST., in Constantinople, the most celebrated ecclesiastical edifice of the Greek Church, now used as a mosque; was built by the Emperor Justinian, and dedicated in 558. It is in the Byzantine style of architecture, has a fine dome rising to the height of 180 feet, and is richly decorated in the interior. With the principal dome are connected two half domes and six smaller ones, which add to the general effect. The mass of the edifice is of brick, but is overlaid with marble; the floor is of mosaic work, composed of porphyry and verd antique. The great piers which support the dome consist of square blocks of stone bound with hoops of iron. The numerous pillars supporting the internal galleries,

etc., are of white and colored marbles, porphyry, granite, etc., and have capitals of various peculiar forms. The interior of the church is 243 feet in width from N. to S., and 269 in length from E. to W., and its general effect is singularly fine.

SOPHISTS. The Greek word *sophistes* (from *sophos*="skilled," "wise") meant originally any one of acknowledged or professed skill; thus, the term was applied to the seven sages (whether philosophers, like Thales, or statesmen, like Solon), to poets, musicians, etc. In the 5th and 4th centuries B. C. it came to be applied specially to those who made a profession of teaching all or any of the higher branches of learning. The great intellectual awakening of Athens after the Persian War, and the growth of democracy in Sicily and elsewhere, as well as at Athens, which gave skill in public speaking a new importance, led to the demand for an education which should go beyond the old training in "gymnastics" and "music" (*i. e.*, reading, writing, singing, and reciting from the poets). To meet this demand there arose a class of professional teachers, wandering scholars, who undertook to provide what we should call "higher education."

SOPHOCLES, a Greek tragic poet; born in the Attic demus or village of Colonus, 495 B. C., 30 years later than



SOPHOCLES

Æschylus. He received a good education, and at an early age gained the prize in music and gymnastics. He was 15 when the battle of Salamis was fought, and for his remarkable beauty and skill in music he was chosen to lead the chorus which sang the pæan of victory. His first appearance as a dramatist was in 468, when, under memorable circumstances, he had Æschylus for his rival and won the victory. Of the next 28 years of his life nothing is recorded; but it is known that he made poetry his business, and that he composed a great many plays during that period. Not one of them, however, is now extant. The "Antigone," the earliest of his extant tragedies, was brought out in 440, and won the prize. The number of plays attributed to him without question was 113, of which 81 were probably produced after the "Antigone." Seven only are extant, viz., "Antigone," "Electra," "Trachinian Women," "King Œdipus," "Ajax," "Philoctetes," and "Œdipus at Colonus." These exhibit his art in its maturity, and sustain the verdict of ancient and modern critics that Sophocles carried the Greek drama to its highest perfection. He effected a complete change in the constitution of tragedy as Æschylus left it; loosening the connection between the parts of the trilogy and the satiric drama, and making them not one great poem, but four distinct ones; introducing a third actor; and for subjects selecting, not a series of heroic and mythical actions, but for each play one leading fact of real human interest and lasting significance. Sophocles lived to be nearly 90, and in his latest years most probably wrote the "Œdipus at Colonus," so full of sweetness and tender melancholy, and consoling hopes, which was not presented on the stage till five years after the poet's death, 406 B. C.

SOPWITH, THOMAS OCTAVE MURDOCH, a British aviator. He was educated at Cottesmore, and the Seafield Engineering College. In 1910 he won the de Forest prize of $20,000 for the longest flight from England in a British machine by a flight from Eastchurch to Beaumont, Belgium, a distance of 176 miles, in a Howard-Wright biplane. In 1912 he established the Sopwith Aviation Co., Ltd., at Kingston-on-Thames, where aeroplanes and seaplanes are designed and built. He assisted in the turning out of many British aeroplanes during the World War.

SORACTE, a celebrated mountain of Italy, 27 miles N. of Rome, now called Monte Sant' Oreste; height, 2,420 feet.

SORBONNE, an establishment founded at Paris in 1253 by Robert de Sorbon, chaplain to St. Louis, for certain secular priests, who should devote themselves to the study of and gratuitous instruction

in theology. The celebrity of its doctors, the crowds of scholars who sought its degrees, gave the Sorbonne a European fame, which steadily grew from the 14th to the 17th century, from a branch of the theological faculty, it became the faculty itself; its voice was paramount in matters of faith. It was abolished in 1792, revived in 1821 and in 1852 given to the city of Paris and incorporated in the University. New buildings were erected in 1889. The Sorbonne Chapel, where Richelieu is buried, is still standing. The University is admirably constructed for the purposes of higher education. There are over 100 professors and instructors and about 10,000 students.

SORDELLO (sor-del'lō), an Italian poet; born in Gioto, near Mantua, about 1180. He composed poems in the language of Provence, of which 34 remain. One of the most celebrated passages in Dante is on the subject of this poet, and Browning's "Sordello" (1840) is founded on the story of his life. He died about 1255.

SOREL, a city and county-seat of Richelieu co., Quebec, Canada; on Lake St. Peter, at the mouth of Richelieu river, and on the Canadian Pacific and other railways; 45 miles N. E. of Montreal. For many years it was the summer residence of the governor-general of Canada. It has large manufacturing and shipbuilding interests. A fort was built on the site of Sorel in 1665. Pop. about 10,000.

SOREL, AGNES, the mistress of the worthless Charles VII. of France; born in the village of Fromenteau, Touraine, France, in 1409. She came to court in 1431 in the train of the Duchess of Anjou. Her influence was beneficial as long as she lived; she died suddenly, near Jumigny, Feb. 9, 1450.

SORGHUM, a genus of *Andropogoneæ*, sometimes made a synonym of *Trachypogon*. *S. vulgare* is the Indian or great millet, or guinea corn. In 1918 the United States produced 16,532,382 gallons.

SORIA, a city of Spain, in Old Castile, capital of a province of its own name, on the Douro, 113 miles N. E. of Madrid. Adjacent to the town, on the N., are the ruins of the famous city of Numantia, destroyed by the Romans 132 B. C. Pop. (1918) province, 157,856; city, 7,500.

SOROLLA Y BASTIDA, JOAQUIN, a Spanish figure, landscape, and portrait painter, born at Valencia, in 1863. He studied art at the academy of his native city, as well as at Madrid and in Italy, but was especially influenced by his study in Paris of the works of Bastien-Lepage and of Menzel. The two paintings which brought him his first recognition were "Another Marguerite" (1892), now at the St. Louis (Mo.) Museum, and "Fishing Boats' Return," now at the Luxembourg Museum, Paris. The Grand Prix awarded to him at the Paris Salon in 1900 stamped him as one of the most eminent modern painters, and from then on he has produced an almost incredible number of paintings. Although using comparatively simple color schemes, he was highly successful in achieving remarkable color effects, which, together with his very brilliant technique and his sincere representation, have made his pictures extremely popular. Highly successful special exhibitions of his work were held in Paris, London, and New York. His principal subjects are landscapes, marines, mothers with babies, children at play, and fisherfolk, almost all of them placed out of doors in brilliant sunlight. His portraits, which include those of a large number of prominent people, are distinguished by force of characterization and brilliancy of technique. He has been awarded many gold medals in various countries, and examples of his work are to be found in most of the prominent public and private collections. In the United States he is especially well represented in the Metropolitan Museum, New York.

SOROSIS, in botany, a collective fruit, formed of a number of separate flowers, firmly coherent in a fleshy or pulpy mass with the thalamus on which they are situated. The pineapple is an example; each hexagonal division represents a flower, while the crown of leaves above consists of empty bracts. The breadfruit, jackfruit, and mulberry are other examples.

SORRENTO (Latin, Surrentum), a city of Italy, on the S. E. side of the Bay of Naples, on the promontory which separates it from the Gulf of Salerno, 7 miles S. W. of Castellamare. It is an archiepiscopal see and possesses a cathedral. The manufacture of silk and the making of parquetry are extensively carried on. It is celebrated for the mildness and general salubrity of its climate, for its beautiful situation in the midst of orange groves and fruit gardens. In the time of Augustus it was noted for its fine buildings; but few traces of these now exist. Among the Romans the wine of Sorrento was held in high repute. Tasso was a native. Pop. about 7,000.

SORSOGON, a province of the Philippine Islands. It is situated in the southeastern portion of the island of Luzon. Area, 755 square miles. It is almost sur-

rounded by water and is traversed by forest-clad mountains. It produces hemp and copra. Before 1901 it was a district of the Province of Albay. Pop. about 150,000.

SORSOGON, the capital of the Province of Sorsogon, Philippine Islands. It is situated in the S. of the island of Luzon, on the bay of Sorsogon. The bay which almost divides the province is 6 by 12 miles, and forms a good harbor. The town is connected with the Strait of Bernardino on the route from Manila to the United States. Pop. about 18,000.

SOTHERN, EDWARD ASKEW, an English-American comedian; born in Liverpool, England, April 1, 1826. Declining the Church, medicine, or the bar, in 1849 he joined a company of players in Jersey, and soon afterward passed into the stock company of the Theater Royal, Birmingham. From 1852 he appeared in the United States, without much success, till in 1858 "Our American Cousin," by Tom Taylor, was brought out in New York, with Sothern cast for the small part (47 lines) of Lord Dundreary. The piece was a poor thing, and the character of the English peer as playgoers know it was Sothern's own creation, bit by bit. In November, 1861, the play was produced in London at the Haymarket and ran for over 400 nights; and it was again and again revived in later years. Sothern essayed many other characters, but he is remembered chiefly as Dundreary; his other most memorable parts were David Garrick in Robertson's comedy, and perhaps Fitzaltamont in "The Crushed Tragedian"; the latter failed utterly in England, but was always popular in America, whither Sothern returned several times. He died in London, Jan. 21, 1881.

SOTHERN, EDWARD HUGH, an American actor, born at New Orleans, in 1859, the son of E. A. Sothern (*q. v.*). He was educated in England and studied painting in Spain. In 1879, however, he turned his interests to the stage and appeared in a small part with his father at Abbey's Park Theater, New York. He later toured the United States with John McCullough, and England in 1882 and 1883. In the latter year he was the leading comedian in McCullough's company. Since then he has played leading parts in "A Scrap of Paper," "One of Our Girls," "Peg Woffington," etc. In 1887 he formed a company of his own with which he starred in "Lord Chumley," "The Prisoner of Zenda," "The Sunken Bell," "Richard Lovelace," "If I Were King," "John the Baptist," "Lord Dundreary," "Don Quixote," etc. His chief fame, however, is based on his interpretation of Shakespearian rôles. With his company he has produced at various times "Hamlet," "Macbeth," "Twelfth Night,"

EDWARD HUGH SOTHERN

"As You Like It," "Much Ado About Nothing," "Merchant of Venice," "Romeo and Juliet," etc. He has appeared in all parts of the United States and has been highly successful. He was married twice, first to Virginia Harned, and later to Julia Marlowe.

SOUBISE (sö-bēz'), **BENJAMIN DE ROHAN, SEIGNEUR DE**, a famous Huguenot captain; born in Rochelle, France, in 1583. He was the son of René de Rohan, and brother of the famous Henri de Rohan, chief of the Protestant party under Louis XIV. He learned the trade of arms under Maurice of Orange; and when the religious wars again broke out in 1621 he was intrusted with the chief command in Brittany, Anjou, and Poitou. He conducted the war with much spirit, but was eventually obliged to seek refuge in England. In 1625 he made a dashing attack on the royalist fleet in the river Blavet, seized a number of vessels, and captured the islands of Oleron and Ré. He was active at Rochelle during the famous siege in 1627 and 1628, and when the town was captured he retired once more to England. He died in London, England, Oct. 9, 1642.

SOUCHEZ, a small village in Artois, France, about four miles S. W. of Lens, which was the center of a heavy battle between the French and German troops, beginning on May 9, 1915, in which the German lines were temporarily broken. Most of the fighting occurred in and around the village of Souchez, but as a whole became known as the Battle of Artois. The German losses were estimated at 60,000, while those of the French amounted to only about 2,000.

SOUFRIÈRE, a volcano of the island of St. Vincent, West Indies. Its height is 3,700 feet. Violent eruptions have occurred at intervals during the last two centuries, the last on May 7, 1902, simultaneous with the eruption of Mont Pelée, in Martinique, 1,350 persons being killed, the depth of rocks and dust reaching in some places 60 feet.

SOUKHOMLINOFF, GENERAL W. A., a Russian officer, Minister of War at the outbreak of the World War in 1914. He was at that time believed to be of the modern school of military officials and it was supposed that he was largely responsible for the modern innovations which had been instituted in the Russian military service after the Russian-Japanese War of 1904-5. As soon developed, however, the Russian Army was in no such state of efficiency as had been supposed, and to this was added evidence of deliberate treachery in the lack of supplies of war munitions at critical times during the operations against the Germans and Austrians. After the Revolution of 1917 General Soukhomlinoff, though retired before that event, was brought to trial for deliberate treason. This trial was continued after the rise of the Bolsheviki into power, in November, 1917, when he was found guilty and sentenced to life imprisonment.

SOULÉ, PIERRE (sö-lā′), an American statesman; born in Castillon, France, in September, 1802; was educated at the Jesuits' College at Toulouse. In 1817 he went to Bordeaux to complete his education, but took part in the plot against Louis XVIII., was detected and fled to the mountains of the Béarn country. He was pardoned, however, and returned to Paris in 1824, where he became editor of "Le Nain Jaune" ("The Yellow Dwarf"), a paper noted for its extreme liberal ideas. For the publication of a bitter article attacking the ministers of Charles X. he was sentenced to imprisonment, but escaped and arrived in Baltimore, Md., in 1826. Subsequently he went to New Orleans, where he entered politics and was elected to the State Senate in 1845. In 1847 he was appointed to the United States Senate and elected to a full term in that body in 1849. Later he was sent on a mission to Spain with the object of negotiating for the acquisition of Cuba by the United States; and in 1854 was one of the ministers who framed the famous "Ostend Manifesto." Up to the time of Abraham Lincoln's election he had advocated secession, but thereafter favored co-operation. On the passage by the State of the ordinances of secession, however, he tendered his services to the Confederate government, and in 1862 became an honorary aide on the staff of General Beauregard. At the close of the war he returned to New Orleans and practiced law till his death there, March 26, 1870.

SOULT, NICOLAS JEAN DE DIEU (sölt), Duke of Dalmatia and Marshal of France; born of humble parentage in Saint Amans la Bastide, Tarn, France, March 29, 1769. In 1785 he entered an infantry regiment as a common soldier. Raised from the ranks, he became successively lieutenant and captain in his regiment. At that time he served on the upper Rhine and greatly distinguished himself at Kaiserlautern, Weissenburg, Fleurus, and other places, and after successive promotions was named General of Division by Masséna, to whose army he was attached. In the unsuccessful campaign in Italy he was wounded and taken prisoner, but obtained his liberty after the victory of Marengo in 1800. In 1803 he had the command of one of the three camps of the army intended against England, that at St. Omer. He was one of the marshals created immediately after the formation of the empire in 1804; and in the Austrian War, in 1805, distinguished himself at Ulm and Austerlitz. He acquired new fame in the Prussian campaign; and in 1807, after the battle of Friedland, took Königsberg. From 1808-1812 he fought in Spain, but, overmatched by Wellington, was unable to gain many laurels. In 1813 he was recalled in consequence of Napoleon's disasters, to take the command of the 4th Corps of the Grand Army, and commanded the infantry of the guard at Lützen. On the news of Wellington's victory at Vittoria he was sent back to reorganize the French force in Spain, and did his utmost to oppose Wellington's triumphant career till Napoleon's abdication. Soult gave in his adhesion to Louis XVIII., who appointed him commander of the 13th Military Division; and in 1814 made him Minister of War. On Napoleon's return he joined his standard, and held the post of major-general of the army in the campaign of Waterloo. After the second restoration he took up his

residence at Düsseldorf, but was permitted to return to France in 1819; and in 1827 was raised to the peerage. After the July revolution of 1830, and on two subsequent occasions, he held ministerial office, and in 1846, on retiring from public life, was created Grand-Marshal of France. He died in St. Amans, Nov. 26, 1851.

SOUND, strictly the sensation which results from the stimulating action of atmospheric or other vibrations upon the aural nerves. Beyond ourselves it has no existence, it is purely subjective, and as a sensation must be carefully distinguished from the vibratory motion which is one of the necessary conditions of its existence. Further, the existence of this vibratory motion is itself conditioned by two things—a distributing cause and a suitable medium for transmitting the disturbance to the ear. The study of these in all their possible relations constitutes the science or theory of sound. Sounds are usually classified under the two heads of noises and musical sounds. A musical sound is caused by a regular series of exactly similar disturbances or pulses succeeding each other at precisely equal intervals of time; if these conditions are not fulfilled, the sound is a noise.

SOUNDING, the operation of trying the depth of water and the quality of the bottom, especially by means of a plummet sunk from a ship. In navigation two plummets are used, one called the hand lead, weighing about eight or nine pounds; and the other, the deep sea lead, weighing from 25 to 30 pounds. The former is used in shallow waters, and the latter at a distance from shore. The nature of the bottom is commonly ascertained by using a piece of tallow stuck upon the base of the deep-sea lead, and thus bringing up sand, shells, ooze, etc., which adhere to it.

The Thomson sounding apparatus consists of an iron drum attached to a frame. The wire to which the lead is attached is wound around a grooved disk controlled by a clutch. A dial on one side of the frame registers the depths. The Sigsbee sounding device is the invention of Admiral Sigsbee, U. S. N.

SOURABAYA, or **SURABAYA,** a seaport of Java, capital of a province of the same name (area, 2,091 square miles; pop., about 3,000,000), on the Strait of Madura. It possesses a large and secure harbor; a building yard, graving dock, and an extensive trade in exports of native produce, and imports of European manufactures. Pop. about 175,000.

SOURAKARTA, or **SOLO,** a town of Java, capital of the province of the same name (area, 2,404 square miles; pop. about 1,750,000), 140 miles W. S. W. of Sourabaya. It has manufactures of cotton and other tissues, leather, etc. Pop. about 125,000.

SOUSA, JOHN PHILIP, an American musician and conductor, born in Washington, D. C., in 1854. He studied music and began teaching at the age of 15. From 1880 to 1892 he was the leader of the United States Marine Corps band. In the latter year he organized his own band, and for many years successfully toured Europe and the United States. In 1911 he

JOHN PHILIP SOUSA

made a tour of the world. He was a prolific composer of music, especially of marches, many of which attained wide success. He also wrote music for several operas. He wrote "The Fifth String" (1905); "The Dwellers in the Western World," and "Through the Year with Sousa" (1910). During the World War he conducted musical instruction at the Naval Training Station, Great Lakes, and there organized a remarkable band which was used in recruiting in various parts of the country.

SOUTH AFRICA, UNION OF, a political division of South Africa, extending from the southernmost point of the African Continent to the course of the Limpopo river, *i.e.*, from 34° 50′-22° S. latitude, and including all the British territories within those limits, with the exception of Basutoland and the Swaziland and Bechuanaland Protectorates, while provi-

sion is made for the future inclusion within the Union of those territories and of the territories of the British South Africa Company.

Topography and Rivers.—The southernmost province contains many parallel ranges, which rise in steps toward the interior. The southwestern peninsula contains the famous "Table Mountain" (3,582 feet), while the "Great Zwarte Region" and "Lange Bergen" run in parallel lines from W. to E. of the Cape province. Between these two ranges and the "Roggeveld" and "Nieuweveld" to the N. is the Great Karoo Plateau, which is bounded on the E. by the "Sneeuwbergen," containing the highest summit in the province (Compassberg, 7,800 feet). In the E. are ranges which join the "Drakensbergen" (11,000 feet), between Natal and the Orange Free State. The Orange Free State presents a succession of undulating grassy plains with good pasture-land, at a general elevation of some 3,800 feet, with occasional hills or kopjes. The Transvaal is also mainly an elevated plateau with parallel ridges in the "Magalies" and "Waterberg" ranges of no great height. The veld or plains of this northernmost province is divisible into the Hooge Veld of the S., the Banker Veld of the center, and the Bush veld of the N. and E., the first and second forming the grazing and agricultural region of the Transvaal and the last a mimosa-covered waste. The eastern province of Natal has pastoral lowlands and rich agricultural land between the slopes of the Drakensberg and the coast, the interior rising in terraces as in the southern provinces. The Orange, with its tributary, the Vaal, is the principal river of the S., rising in the Drakensbergen and flowing into the Atlantic between the Protectorate of Southwest Africa and the Cape of Good Hope. The Limpopo, or Crocodile river, in the N., rises in the Transvaal and flows into the Indian Ocean through Portuguese East Africa. Most of the remaining rivers are furious torrents after rain, with partially dry beds at other seasons.

Area and Population.—The total area of the Union is 473,096 square miles, divided as follows: Cape of Good Hope, 276,966; Natal, 35,291; Transvaal, 110,450; Orange Free State, 50,389 square miles. The white population in 1918 was 1,436,611. The colored population in 1911, the last year for which definite figures are available, was 4,697,152. The principal towns are Johannesburg, Cape Town, Durban, Pretoria, Port Elizabeth, Pietermaritzburg, East London, Benoni, Kimberley, Germiston, Bloemfontein, Krugersdorp, and Boksburg. The death rate is usually slightly above 10 per thousand, but in 1918, as the result of the influenza epidemic, it rose to over 17 per thousand.

Instruction.—In April, 1918, the institutions for higher education were reorganized, and there are now three universities, the University of Cape Town, the University of Stellenbosch, and the University of South Africa. There are also several colleges administratively connected with these universities. The total number of students in 1918 was 2,069, the total number of professors and instructors 252. Schools other than those for higher education in 1917 numbered 4,945 for white scholars, with 259,076 students; and 2,670 for colored students, with 187,866 students, having a total of 17,971 teachers, and expenditures of £3,169,889. There are also a number of training colleges and special schools.

Finances.—The ordinary revenue and expenditures of the Union in 1918-19 was £19,256,000 and £19,858,824 respectively. The public debt of the Union on March 31, 1920, was estimated at £166,270,000.

Defense.—Toward the end of the World War all the British troops stationed in South Africa were withdrawn and the Union itself provided all military forces necessary for its defense. These were raised under the Defense Act, which makes all citizens liable to service within the Dominion. Only a certain proportion of the younger men, however, are annually enrolled and trained. These form the Active Citizen Army, the members of which, after four years, become members of the Citizen Reserve Force, until the age of 45. There are also a Coast Garrison Force, a Permanent Force, and a National Reserve, the latter comprising all citizens between the ages of 17 and 60 not belonging to any of the other forces. Boys between 13 and 17 are compulsorily enrolled in a cadet corps, wherever this is possible. During the World War 136,070 white and 92,837 natives enlisted from the Union. All of these, with the exception of an infantry brigade and several other white units, as well as some 3,000 officers of the Royal Air Force, were used in the operations in Africa.

Agriculture and Production.—In 1918 the total acreages under cultivation were as follows: Cape Province, 3,152,209; Natal, 1,106,618; Transvaal, 3,012,844; Orange Free State, 2,814,893. In the same year the total production of wheat in the entire Union was 600,000,000 pounds, oats 335,000,000 pounds, of maize 1,942,000,000 pounds. Other important crops were barley, rye, kafir, corn, peas and beans, potatoes, sweet potatoes, onions, tobacco, and sugar. The live-stock in 1918 consisted of 6,852,000 cattle, 781,000 horses, 84,500 mules, 554,000 donkeys, 314,000 ostriches, 30,000,000 sheep, 8,000,000 goats, 1,000,000 pigs, and 9,500,000

poultry. The export of wool in 1918 amounted to over 115,634,000 pounds, of mohair to over 19,600,000 pounds, of hides to over 12,500,000 pounds, of skins to over 30,275,000 pounds, and of mealies to over 509,000,000 pounds. Both the production of cotton and sugar is on the increase. The total extent of forest reserve areas in 1919 was about 2,092,000 acres. The importance of the dairying industry is steadily growing, and in 1918 the production of butter amounted to about 20,000,000 pounds, and of cheese to about 6,000,000 pounds. Irrigation is becoming of greater importance every year, and in 1917-18 the government expenditure for irrigation amounted to more than £500,000.

Manufactures.—As a result of the World War and the shortage of shipping facilities caused by it, the local manufactures of the Union received a great impetus. Among the most important industries are the production of leather, cement, beer, matches, tobacco, dynamite, soap, rope, furniture, vehicles, etc. The industrial census of 1917-18 showed a gross production of £60,828,440 in 5,919 factories, with a total capital of £53,171,000, and an average number of employees of 134,211, of whom 49,908 were white.

Mining.—Gold mining is the chief source of the Union's wealth. In 1918 the total amount of gold mined was 18,252,000 fine oz., valued at £35,759,000. The total value of diamonds was £7,145,000 and of coal £3,225,000. Copper, tin, lime, silver, salt, and asbestos are other important mineral products, and the total value of the mineral output of the Union in 1918 was £47,737,738. In the various mining industries there were employed in 1918, 295,804 persons, of whom 32,820 were white.

Commerce.—The total value of imports and exports, exclusive of specie, in 1913, the last year previous to the World War, were respectively £41,828,841 and £66,569,364. In 1918 they were respectively £49,487,168 and £32,949,237. Over 50% of the imports of general merchandise in 1918 came from the United Kingdom, about 14% from British possessions, or a total of over 67% from the British Empire. The United States leads all the foreign countries in imports, with a total value of £6,771,238, or 13.8% of the total. Japan, the Belgian Congo, Sweden, Brazil, Argentine, Switzerland, France and Holland are the other countries from which imports of considerable value are made.

Shipping and Communications.—In 1918 the total number of vessels entered from overseas was 1,036, of 2,989,000 tons net, and the total number of coastwise vessels was 1,780 of 2,541,000 tons net. Upon the formation of the Union the former state railways of the several colonies were merged into one system, the South African railways, which is under the control of the Union Government. In 1919 the total mileage was 9,542, representing a total capital expenditure of over £93,000,000. For 1918-19 the gross earnings were over £15,000,000, and the net loss, after payment of interest, £896,267. At the end of 1918 there were 2,623 post-offices, 15,951 miles of telegraph line, and 3,214 miles of telephone line.

Banks.—The five banks of the Union in 1918 had a subscribed capital of £10,515,900, of which over £5,000,000 was paid in, and deposits of over £72,000,000. In the same year the number of depositors in the government savings banks was 288,833, with deposits of over £7,200,000.

Government.—The Union of South Africa was constituted under the South Africa Act of 1909, under the terms of which the self-governing colonies of the Cape of Good Hope, Natal, the Transvaal, and the Orange River Colony were united on May 31, 1910, in a legislative union under one government. These colonies became original provinces of the Union. The Governor-General, appointed by the sovereign, administers the executive government of the Union, together with an executive council, the members of which are chosen by the Governor-General. Various departments of state have been established, the heads of which, not exceeding ten in number, are appointed by the Governor-General. The legislative power is vested in a Parliament consisting of the king, a Senate, and a House of Assembly. Session of Parliament must take place every year. The senate consists of 40 members, each of whom must be a British subject of European descent. The House of Assembly consists of 130 members and is elected for five years. The Cape of Good Hope elects 51, Natal 17, the Transvaal 45, and the Orange Free State 17 members. In most respects membership qualifications are similar to those existing for members of the British Parliament. The House of Assembly originates money bills. It cannot pass a bill for taxation or appropriation unless it has been recommended during the session by a message from the Governor-General. The right of the Senate to amend money bills is restricted. Pretoria is the seat of the Government of the Union. Cape Town is the seat of the Legislature. Each province is administered by an administrator, appointed by the Governor-General for five years, and a provincial council elected for three

years. Both the English and Dutch languages are official. The Governor-General in 1920 was Viscount Buxton, and the Prime Minister, General J. C. Smuts. The Union is represented in London by a High Commissioner. The administration of justice is in the hands of the various courts, consisting of the Appellate Division and several provincial divisions of the Supreme Court of South Africa.

History.—The history of the Union of South Africa, properly speaking, of course, begins only with the formation of the Union in 1910. Previous to that date the history is identical with that of its several provinces, where it is treated more extensively.

The first Governor-General was Viscount Gladstone, the son of the famous British statesman. The first cabinet of the Union was headed by General Botha and included among others, Generals Smuts, Hertzog, and Fischer. In 1912 a cabinet crisis developed as a result of General Hertzog's claims that Premier Botha over-emphasized the interests of the British Empire as compared to those of the Union, and showed too strong leanings toward imperialism. The points at issue were closely connected with the opposition to the presence of large numbers of Hindoo laborers, and with the restrictive legislation against these Hindoo laborers which had been passed. The crisis finally resulted in the splitting of the Nationalist Party into two factions. The matter eventually was settled, at least partially. In 1913 an extensive strike of the miners on the Rand occurred. In spite of considerable violence and the calling out of troops, the strike was eventually settled by the intervention of the government. A general strike of all miners attempted in 1914 failed as a result of the quick action of the government in arresting the leaders and in forcibly deporting them to England. The Union Parliament passed stringent laws against all forms of picketing, strikes on public works were made a penal offense, and the Government was given permission to deport anyone convicted of public violence or sedition. The working classes of the Union met this legislation by organizing a Labor Party, in opposition to the Nationalist and Unionist parties.

At the outbreak of the World War in 1914, both the Government and the Parliament of the Union immediately pledged their unfaltering loyalty to the Empire. The government, as early as September, 1914, determined upon the invasion of German Southwest Africa. The details of the campaigns of the Union forces in this former German colony, as well as those of the later campaigns in German East Africa, are given in the article on the WORLD WAR (*q. v.*).

The first campaign against German South Africa, however, was interrupted in October, 1914, by a revolt led by three former Boer leaders, Lieutenant-Colonel Maritz, General Christian de Wet, and General Christian F. Byers. General Botha immediately assumed command against his three former comrades at arms, and by December, 1914, the revolt had practically collapsed after General de Wet had been made a prisoner and General Byers had been killed. Lieutenant-Colonel Maritz had been forced to flee into German territory. An internal revolt under the leadership of General Hertzog broke out in February, 1915, but was quickly suppressed by the arrest of most of the leaders. All these were tried and sentenced to fines and terms of imprisonment of varying degrees.

In 1915 the Union sent an expeditionary force to the western front. Anti-German feeling throughout the Union was intense, and serious demonstrations occurred, especially in 1915, in many of the larger cities. In August, 1915, Parliament was dissolved. The new Parliament elected in October contained a majority for the Government indicating strong popular support of General Botha's policies. Soon after the meeting of Parliament, General de Wet and many of his followers, all of whom had been convicted of high treason, were pardoned. Parliament passed various important bills providing for the reorganization of higher education and for the unifying of the laws of the separate provinces. A "Trading with the Enemy Act" was also passed. In January, 1917, General Smuts, then in command of the Union forces operating in German East Africa, was sent to Europe as the representative of the Union Government at the Imperial War Conference in London. Although the Nationalists continued their opposition to the government and to its principle of active participation in the war, this opposition did not reflect truly the popular attitude, and the Botha government was not only able to maintain itself, but even to increase its majority in Parliament. Late in 1917, a slight rapprochement between the Unionists and Nationalists took place.

At the Peace Conference the Union was represented by General Botha and General Smuts, both of whom took an active and influential part in the deliberations of the Conference. In May, 1919, the Supreme Council awarded the mandate over German Southwest Africa to the Union of South Africa. At the time the Peace Treaty came up for sig-

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SOUTH AMERICA
NORTHERN PART
SCALE OF STATUTE MILES
0 50 100 200 300 400 500
SCALE OF KILOMETERS
0 100 200 300 400 500 600 700 800
Important towns are shown in heavy face type
Railways shown thus
RIO DE JANEIRO
SCALE OF MILES
0 1 2 3
ATLANTIC OCEAN
EQUATOR
Mouths of the Amazon River
Rio Para or Tocantins
Rio de Janeiro
Greenwich

PACIFIC OCEAN
ATLANTIC OCEAN
BOLIVIA
CHILE
ARGENTINA
PARAGUAY
URUGUAY
TROPIC OF CAPRICORN
Iquique
Tocopilla
Cobija
Antofagasta
La Serena
Valparaiso
Concepcion
Valdivia
Chiloe
Aneud
Gulf of Penas
Strait of Magellan
Cape Horn
Tierra del Fuego
Staten I.
Falkland Islands (Br.)
Port Stanley
Buenos Aires
Rosario
Mendoza
Tucuman
Jujuy
Salta
Asuncion
Formosa
Corrientes
Santa Fe
Cordoba
Bahia Blanca
Rio Negro
Territory of the Pampas
Territory of the Chubut
Territory of Santa Cruz
Territory of Tierra del Fuego
Great Plateau of Patagonia
Longitude

SOUTH AMERICA

SOUTHERN PART

SCALE OF STATUTE MILES

0 50 100 200 300 400 500 600

SCALE OF KILOMETERS

0 100 200 300 400 500 600 700 800

Important towns are shown in heavy face type

Railways shown thus

STATES OF CHILE.

1. Aconcagua.
2. Valparaiso.
3. Santiago.
4. O'Higgins.
5. Colchagua.
6. Curico.
7. Talca.
8. Maule.
9. Linares.
10. Nuble.
11. Concepcion.
12. Biobio.
13. Arauco.
14. Mallico.
15. Cautin.

STATES OF URUGUAY.

1. Artigas.
2. Salto.
3. Rivera.
4. Paysandu.
5. Tacuarembo.
6. Cerro Largo.
7. Rio Negro.
8. Durazno.
9. Treinta-y-Tres.
10. Soriano.
11. Flores.
12. Florida.
13. Minas.
14. Rocha.
15. Celonia.
16. San Jose.
17. Canelones.
18. Maldonado.

nature, General Smuts made a strong protest against some of its terms and announced that he signed the Peace Treaty only under protest. General Botha returned home in July, 1919, and died suddenly at Pretoria on Aug. 28, 1919. He was succeeded as Premier by General Smuts. As compared with most of the other countries which had been involved in the World War, the Union suffered, during 1919 and 1920, comparatively few of the difficulties which the return to peace conditions brought about elsewhere. Business was in a prosperous condition and the far-sighted policies of the government in respect to the re-establishment of ex-soldiers and to the prevention of unemployment, met the issues at stake successfully.

SOUTH AFRICAN WAR. See BOER WAR.

SOUTH AMBOY, a city of New Jersey, in Middlesex co. It is on the Raritan river and bay, directly opposite Perth Amboy, and on the Pennsylvania, the Central of New Jersey, and the Raritan River railroads. It is an important manufacturing city and has pottery, terra cotta, underwear, cigars, and brick manufactures. Pop. (1910) 7,007; (1920) 7,897.

SOUTH AMERICA. See AMERICA.

SOUTHAMPTON, a borough and seaport town of England, in the county of Hants, on a peninsula at the mouth of the Itchen, near the head of Southampton Water, 18 miles N. W. of Portsmouth, and 79 miles S. W. of London. It is built on rising ground, and consists of an old and a new town, the former at one time surrounded by walls flanked with towers, of which portions still remain; and entered by several gates, of which three, still standing, bear the names of West Gate, South Gate, and Bar Gate. The last, a remarkable structure, and large enough to contain the town hall in the upper part of it, is now, in consequence of the growth of the town, nearly in its center, and being placed across the principal street, divides it into two parts, the part to the N. being named Above-bar, and to the S. Below-bar or High street. The streets in the older quarters are very irregular, while those in the more modern portion present many fine ranges of buildings. St. Michael's, the oldest of the churches, situated in the W. part of the town, is a spacious Norman structure with many interesting features. Other buildings of interest are the Southampton College, the Hartley Institution, the guild hall, custom house, audit house, the theater, philharmonic rooms, assembly rooms, ordnance map office, baths, etc. About 6 miles from Southampton, and 3 miles from Netley Abbey, is the Victoria Hospital for sick soldiers. The first tidal dock was opened for business in 1842. There is ample dock accommodation, and Southampton is one of the most important ports in the kingdom. The manufactures are chiefly confined to brewing, coach building, iron casting, sugar refining, and shipbuilding. Southampton claims to be a borough by prescription, but its earliest known charter was granted by Henry II. Pop. (1919), 126,033.

SOUTHAMPTON, THOMAS WRIOTHESLEY, 1ST EARL OF; born about 1490, and educated at Cambridge, became lord-chancellor of Henry VIII. in 1544. He was one of the executors of the will of Henry, and was created Earl of Southampton by Edward VI. Died in 1550. HENRY WRIOTHESLEY, 3d earl, grandson of the preceding; born in 1573; was a patron of Shakespeare, who dedicated to him the poems of "Venus and Adonis," and the "Rape of Lucrece." He was a friend of the Earl of Essex, and was accused of complicity in the latter's treasonable designs. He was convicted and sentenced to death and attainder; but the death sentence was remitted by Elizabeth, and the attainder was removed by Parliament after the accession of James. He was a firm supporter of liberty, and in 1621 was committed to close custody by the king, but was released through the influence of Buckingham. He aided the Dutch in their struggle against Spain, and died in Bergen-op-Zoom in 1624. THOMAS WRIOTHESLEY, 4th earl, born in 1600, was at first a supporter of the Commons in resisting the encroachments of Charles I., but with Strafford went over to the royal side and was made a privy councillor. Being one of the leaders of the moderate party he lived unmolested in England during the Commonwealth. Upon the restoration of Charles II. he was made lord high treasurer. He died in 1667.

SOUTHAMPTON WATER, an inlet of the sea, in the S. of England, about 11 miles in length, running from the Solent into Hampshire in a N. W. direction. It receives the rivers Anton, Itchen, and Hamble. The tidewater being intercepted each way by the Isle of Wight, it has four tides in the 24 hours. The port of Southampton is situated near its head.

SOUTH AUSTRALIA, a state of the Commonwealth of Australia, situated between 26° and 37° S. lat., and 129° and

141° E. long. Area, 380,070 square miles. Pop. (1918) about 475,000. The eastern portion of the state is divided longitudinally by the Flinders Range, which extends from the eastern side of the Gulf of St. Vincent to the Lakes Torrens and Eyre. The western portion is partly desert which can never be brought into cultivation. The northern portion of the state, between Lake Eyre and 26° S. lat., is also unpromising in comparison with the fertile land that surrounds the hill country of the E. Except for the Murray, which flows for some 250 miles through the southeastern corner into the Southern Ocean, there are no rivers of importance in South Australia. The mean annual temperature at Adelaide is 63°, the winter temperature (July-August) averaging 53°, and the summer (November-March) 71°. During the summer months the maximum temperature at times exceeds 100°, but owing to the purity and dryness of the atmosphere the inconvenience is comparatively slight. The average annual rainfall at Adelaide is 21.01 inches.

South Australia became a British province in 1836, and in 1851 a partially elected Legislative Council was established. The present constitution originated in 1856, and vests the executive authority in a Governor appointed by the Crown, and in a Council of six ministers, and a Lieutenant-Governor. The state is represented in London by an Agent-General. Parliament consists of a Legislative Council of 20 members, elected for six years, and a House of Assembly of 46 members, elected for three years. Election to the House is by ballot with universal adult suffrage for all British subjects, male and (since 1899) female. Electors to the Legislative Council must meet a small property qualification.

The administration of law and justice is in the hands of a Supreme Court, courts of vice-admiralty and insolvency, local civil courts, and police courts.

Public education is compulsory, secular, and free, and is provided by the state under the direction of a responsible minister. In 1918 there were 913 schools, of which 43 were high schools, with 73,502 pupils, and about 170 private schools with about 14,000 pupils. There is also a training college for teachers, a state school of mines and industries, and an endowed university at Adelaide, founded in 1874, with about 400 undergraduates and about 650 other students. The state also supports or assists the public library, museum, art gallery, and local institutions. The approximate number of churches and chapels of the state in 1920 was 1,750. The state does not give any financial aid for religious purposes. The Church of England and the Methodists have the largest membership, followed by the Roman Catholic Church, the Lutherans, Presbyterians, Baptists, and Congregationalists.

The revenue for the year ending June 30, 1919, was £5,798,314, the expenditure £5,876,807, and the public debt £42,650,206.

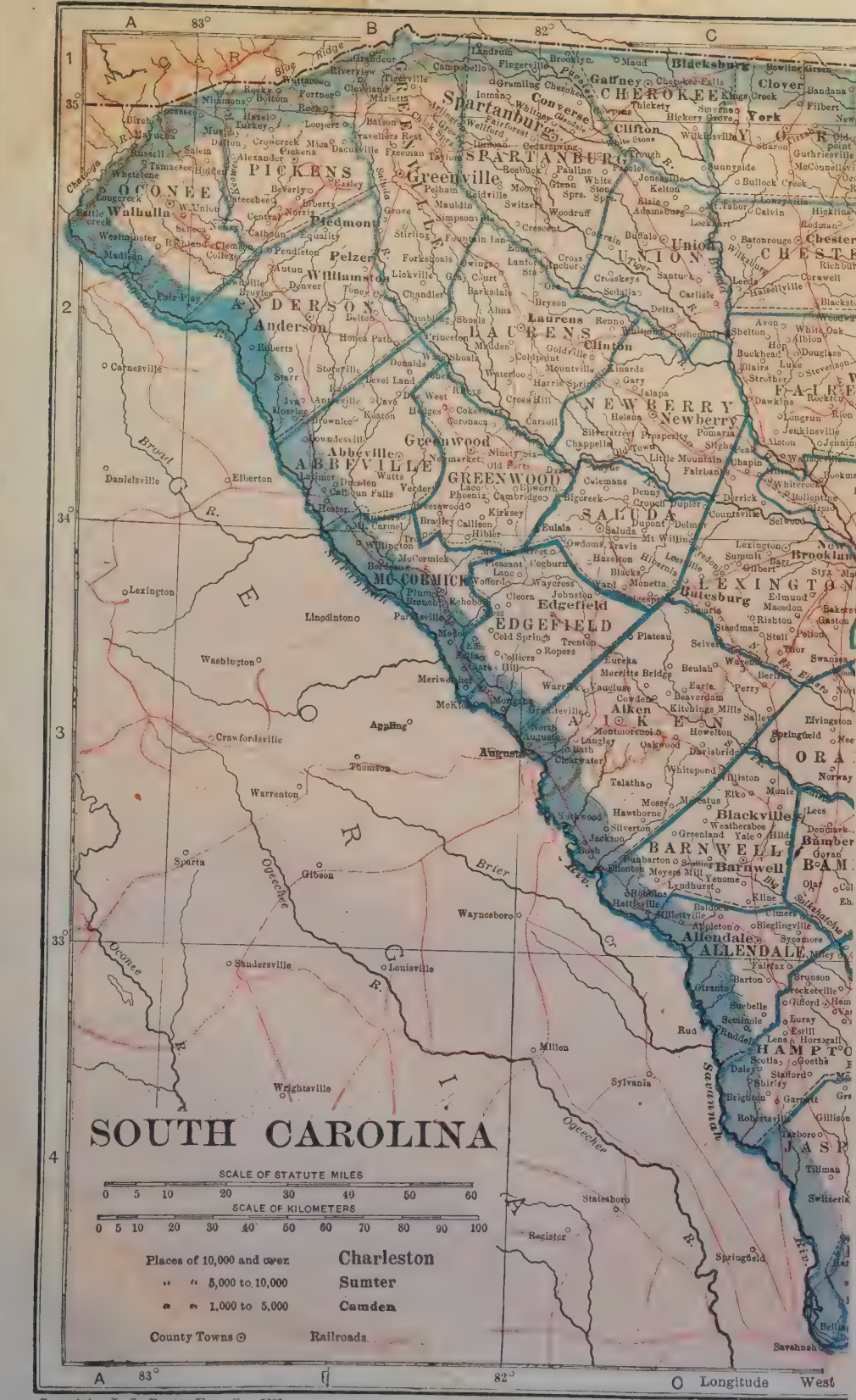
About 5,000,000 acres are under cultivation, the chief crops being wheat, hay, oats, and barley. Fruits, including oranges, lemons, almonds and olives, are grown extensively. About 30,000 acres are in the form of vineyards, and the production of currants and raisins is of considerable importance. In 1918 there were over 6,000,000 sheep, about 315,000 cattle, about 265,000 horses, and about 110,000 pigs.

The most important mineral is copper, the production of which since the foundation of the state, is estimated at nearly £32,000,000. There are also gold, silver, lead, manganese, iron, coal, etc., and the total mineral production in 1918 was valued at £1,500,000.

In 1918 there were 1,285 factories, with 26,634 employees, and a production of almost £20,000,000. The export of the state is important, averaging about £10,000,000 annually, and consisting chiefly of wheat, flour, wool, meats, skins and hides, butter, tallow, leather, etc. The imports in 1918-1919 were valued at almost £6,500,000. In 1919 there were 3,400 miles of railway, 114 miles of electric tramways, and 44,000 miles of roads. There were also 813 post-offices.

Besides the capital, ADELAIDE (*q. v.*), with a population of (1918) 235,751, there is only one other town of over 10,000 inhabitants, Port Pirie (13,000). Other towns are Moonta, Kadina, Wallaroo, Port Augusta, Gawler, and Mt. Gambier. See AUSTRALIA: AUSTRALIAN COMMONWEALTH.

SOUTH BEND, a city and county-seat of St. Joseph co., Ind.; on the St. Joseph river, and on the Vandalia, the Michigan Central, the Lake Shore and Michigan Southern, Grand Trunk, the Chicago, Indiana and Southern and the New Jersey, Indiana and Illinois railroads; 88 miles E. of Chicago. It contains the University of Notre Dame, St. Mary's and St. Joseph's Academies (R. C.), a public library, high school, Protestant and Roman Catholic hospitals, street railroad and electric light plants, waterworks, National and savings banks, and daily, weekly, and monthly periodicals. South Bend is particularly noted for the manufacture of sewing machines, agricul-



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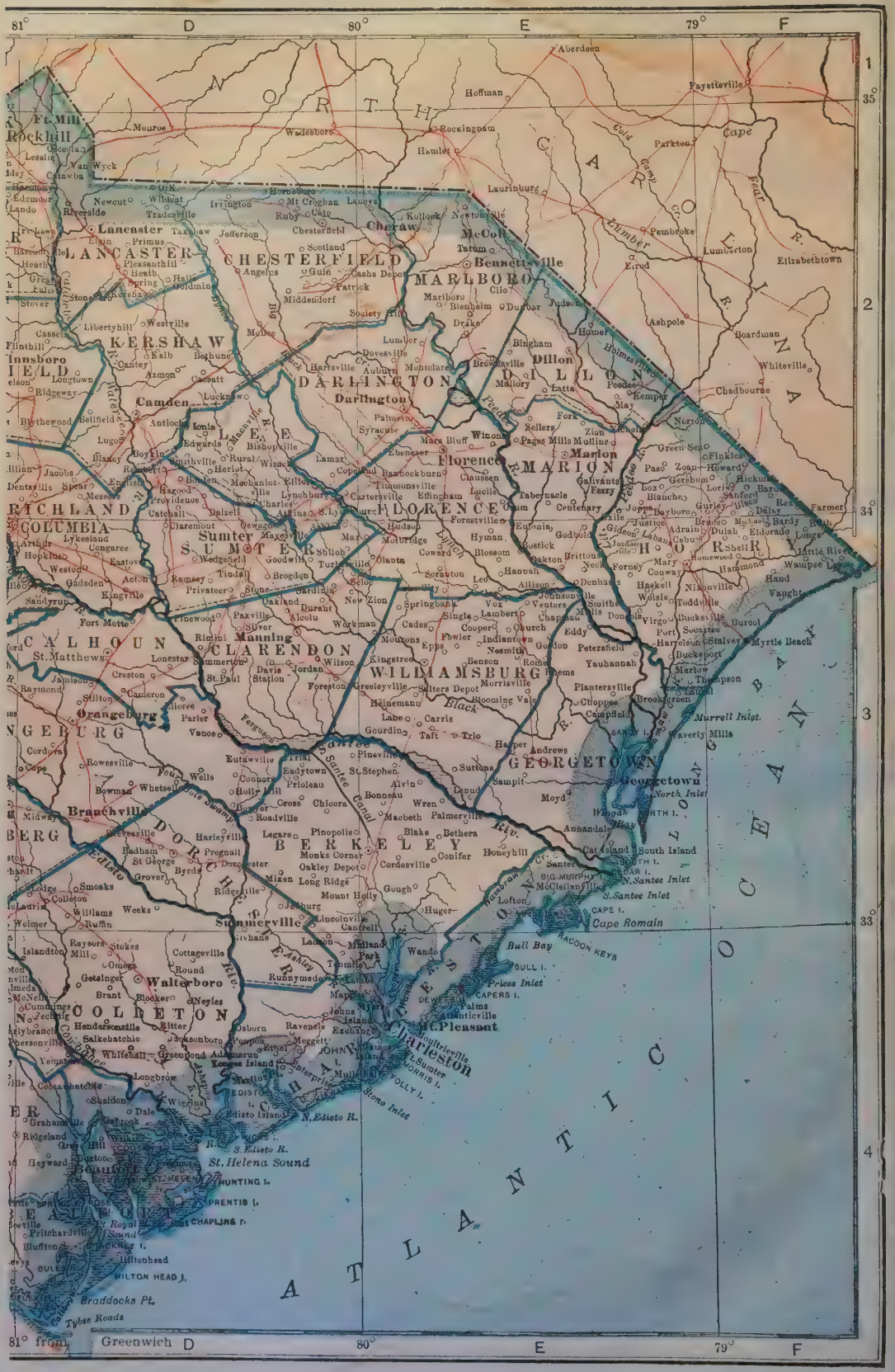
81° D 80° E 79° F
NORTH CAROLINA
ATLANTIC OCEAN
Aberdeen
Hoffman
Fayetteville
Rockingham
Cape Fear R.
Parkton
Laurinburg
Lumberton
Elizabethtown
Pembroke
Ashpole
Boardman
Whiteville
Chadbourne
Fc.Mill
Rockhill
Monroe
Wadesboro
Hamlet
Cheraw
McColl
Bennettsville
Tatum
Clio
Marlboro
Dillon
Latta
Peedee
Kemper
Lancaster
Chesterfield
Angelus
Cashs Depot
Patrick
Middendorf
Society Hill
Drake
Homer
Kershaw
Camden
Lucknow
Darlington
Lamar
Florence
Timmonsville
Effingham
Lucile
Tabernacle
Centenary
Marion
Galivants Ferry
Gresham
Joppa
Loris
Conway
Columbia
Sumter
Claremont
Mayesville
Hudson
Motte
Forestville
Hyman
Gustick
Gideon
Adrain
Dulah
Eldorado
Longs
Rhesus
Little River
Wampee
Hammond
Homewood
Mary
Forney
Haskell
Nixonville
Vaught
Hand
Todd
Buckville
Burcol
Myrtle Beach
Stalvey
Harrelson
Port Scuatee
Bucksport
Marlow
Thompson
Laurel
Calhoun
Rimini
Manning
Clarendon
Kingstree
Wilson
Benson
Nesmith
Gordon
Peterfield
Yauhannah
Plantersville
Brookgreen
Choppee
Campfield
Waverly Mills
Murrell Inlet
Georgetown
North Inlet
Winyah Bay
North I.
Orangeburg
Williamsburg
Morrisville
Blooming Vale
Indiantown
Eddy
Cooper
Church
Single
Lambert
Vox
Springbank
Cades
Epps
Fowler
Mouzons
Greeleyville
Foreston
Jordan
Davis Station
Oakland
Durant
Alcolu
Workman
Paxville
Silver
Fort Motte
Pinewood
Sumter
Shiloh
Turbeville
Olanta
Coward
Scranton
Lynch
Peedee
Black
Waccamaw
Pee Dee
Lake Swamp
Great Pee Dee
Little Pee Dee
Lynches
Edisto
Santee Canal
Cooper
Wando
Ashley
Goose Creek
Charleston
Mt. Pleasant
Sullivans I.
Fort Sumter
Morris I.
Folly I.
Stono Inlet
Bull Bay
Racoon Keys
Capers I.
Prices Inlet
Dewees I.
Palms
Atlanticville
Cape Romain
Santee
Lofton
Huger
Cainhoy
Jamestown
Rembert
Big Murphy
McClellanville
Cat Island
South Island
South I.
Bar I.
N. Santee Inlet
S. Santee Inlet
Cape I.
Andrews
Georgetown
Sampit
Alvin
Bonneau
Wren
Macbeth
Palmerville
Pineville
Eutawville
Eadytown
St. Stephen
Suttons
Lapud
Moyd
Harper
Blake
Bethera
Conifer
Honeyhill
Annandale
Pinopolis
Monks Corner
Oakley Depot
Cordesville
Berkeley
Dorchester
Summerville
Jedburg
Lincolnville
Canterell
Harleyville
Legaro
Ridgeville
Long Ridge
Mixen
Gough
Mount Holly
Roadville
Chicora
Proleau
Holly Hill
Connor
Wells
Whetsell
Bowman
Branchville
Midway
Grover
Byrds
Dorchester
Pregnall
St George
Badham
Smoaks
Colleton
Williams
Weeks
Ruffin
Walterboro
Neyles
Blocker
Brant
Cummings
Coleton
Hendersonville
Bitter
Salkehatchie
Jacksonboro
Pon Pon
Osborn
Ravenels
Exchange
Johns Island
Myrtle
Meggett
Ethel
Whitehall
Greenpond
Adams Run
Yonges Island
Bohicket
Longbrow
Wiggins
Sheldon
Dale
Edisto Island
N. Edisto R.
S. Edisto R.
St. Helena Sound
Beaufort
Hunting I.
Prentis I.
Chaplins I.
Hilton Head I.
Hiltonhead
Braddocks Pt.
Tybee Roads
Greenwich
81° from
80°
79°
1
2
3
4
35
34
33

tural implements, carriages, and wagons. Besides these it has manufactories of furniture, varnish, brick, woolen goods, chinaware, toys, boilers, concrete machinery, patent medicines, pulp, paper, etc. The city is built on historic ground. In 1679 La Salle landed here during his exploration of the Mississippi. At that date the place was inhabited by the Miami Indians and later by the Pottawatomies. Pop. (1910) 53,684; (1920) 70,983.

SOUTH BETHLEHEM, now joined to Bethlehem, formerly a borough in Northampton co., Pa.; on the Philadelphia and Reading, the Lehigh Valley, and the Central of New Jersey railroads; 57 miles N. W. of Philadelphia. It contains LEHIGH UNIVERSITY, Moravian College for Women, St. Luke's Hospital, waterworks, street railroad and electric lights, National and private banks, and several daily and weekly newspapers. Here are the Bethlehem Steel Works and manufactories of brass goods, machinery, coke, zinc, brick, etc. Pop. (1910) 19,973; (1920) 23,522.

SOUTHBRIDGE, a town in Worcester co., Mass.; on the Quinebaug river, and on the New York, New Haven and Hartford railroad; 20 miles S. W. of Worcester. It comprises the villages of Southbridge, Globe, and Sandersdale, and contains public and parochial schools, a public library, National bank, and several weekly newspapers. It has manufactories of boots and shoes, optical goods, cutlery, cotton and woolen goods, etc. Pop. (1910) 12,592; (1920) 14,245.

SOUTH BRITAIN, England and Wales, as distinguished from Scotland, popularly called North Britain.

SOUTH CAROLINA, a State in the South Atlantic Division of the North American Union; bounded by North Carolina, Tennessee, Georgia, and the Atlantic Ocean; one of the original 13 States; number of counties, 40; capital, Columbia; area, 30,170 square miles; population (1910) 1,515,400; (1920) 1,683,724.

Topography.—The State has a seaboard of 210 miles, and running W. from this is a low, sandy, and in places, marshy plain, from 80 to 100 miles wide. Beyond the plain is what is known as the middle country, consisting of low sand hills. A series of terraces rises W. of this and terminates in the Blue Ridge Mountains, passing through the N. W. of the State. The highest elevation in South Carolina is Table Mountain, 4,000 feet, on the Tennessee border. The principal river, the Santee, is 150 miles long, and is formed by the junction of the Wateree and Congaree. This latter river is formed by the union of the Broad and Saluda rivers. Other important rivers are Cooper and Ashley, emptying into Charleston harbor; the Edisto and Cambabee into St. Helena Sound; the Great Pedee, Little Pedee, Waccamaw, and Black, emptying into Wingah Bay; and the Oosawhatchie into Port Royal Harbor.

Geology and Mineralogy.—A geological break passing through the center of the State divides it into two distinct formations. The "up country" in the W. is of Primary origin, and the "low country" in the E. is of Tertiary, with occasional outcroppings of the Cretaceous. The mountain region in the N. W. has gneiss as its characteristic rock, with granite, hornblende, slates, limestones and clay. The chief mineral products are phosphate rock, granite, and clay products. A small amount of gold is produced, as well as some silver, iron ore and lime. The total value of the mineral output is about $1,500,000 annually.

Agriculture.—The soil is, as a rule, either loam or clay, rich in phosphate, lime, and potash. Cotton, maize, wheat, rice, and sweet potatoes are the chief staples. The magnolia and palmetto grow abundantly along the coast, pine and cypress characterize the low country, and hardwoods the highlands. The acreage, production, and value of the principal crops in 1919 was as follows: corn, 2,340,000 acres, production 37,440,000 bushels, value $73,757,000; oats, 510,000 acres, production 11,730,000 bushels, value $12,903,000; wheat, 204,000 acres, production 1,836,000 bushels, value $4,737,000; tobacco, 135,000 acres, production 81,000,000 pounds, value $18,468,000; hay, 275,000 acres, production 358,000 tons, value $11,098,000; peanuts, 13,000 acres, production 585,000 bushels, value $1,708,000; potatoes, 27,000 acres, production 2,295,000 bushels, value $4,590,000; sweet potatoes, 84,000 acres, production 7,560,000 bushels, value $11,189,000; cotton, 2,881,000 acres, production 1,475,000 bales, value $263,288,000.

Manufactures.—In 1914 there were 1,885 manufacturing establishments in the State. These gave employment to 71,914 wage-earners. The capital invested was $203,211,000, the amount paid in wages was $24,173,000, the value of the materials used $91,009,000, and the value of the finished product $138,891,000. The principal industries were cotton manufactures, lumber and timber products, fertilizers, cottonseed oil and cake, flour and grist mill products, planing mill products, rice cleaning and polishing, turpentine and rosin, railroad cars, cotton ginning, and brick and tile.

Banking.—On Oct. 31, 1919, there were reported 79 National banks in operation, having $9,605,000 in capital; $7,008,000 in outstanding circulation; and $27,599,000 in United States bonds. There were also 342 State banks, with $13,286,000 capital, and $6,062,000 surplus.

Commerce.—The imports of merchandise at the port of Charleston in the fiscal year 1920 aggregated in value $13,941,871; and the exports $32,474,625.

Education.—School attendance in the State is not compulsory, but the employment of illiterate children in factories or mines is restricted. Separate schools are maintained for white and colored children. In 1918 there were 194,687 white and 199,780 colored children enrolled in the schools. There were 2,464 public schools for white children and 2,408 schools for negro children. There were 5,620 white teachers and 3,013 negro teachers. The State appropriated in that year for schools $497,500. In 1909 there was enacted an elaborate general school law. The colleges include Claflin College, at Orangeburg; Woffard College, at Spartanburg; Furman University, at Greenville; South Carolina College, at Columbia; and Newberry College, at Newberry.

Churches.—The strongest denominations in the State are the African Methodist; Regular Baptist, Colored; Regular Baptist, South; Methodist Episcopal, South; Methodist Episcopal; Presbyterian, South; Lutheran, United Synod; Protestant Episcopal; Presbyterian, North; Roman Catholic; Disciples of Christ; Associate Presbyterian; and Methodist Protestant.

Railroads.—The total length of railroads within the State on Jan. 1, 1919, was 3,824 miles.

Finances.—The total receipts for the year ending Dec. 31, 1919, were $7,195,109, and the expenditures amounted to $6,913,500. The public debt of the State on Dec. 31, 1919, was $5,577,804.

Charities and Corrections.—The State maintains a number of charitable institutions, including a hospital for the insane, an asylum for the deaf, dumb and blind, 9 orphanages, 10 hospitals, and 10 homes for adults and children, which are maintained chiefly by private charity.

State Government.—The governor is elected for a term of two years. Legislative sessions are held annually beginning on the second Tuesday in January, and are limited in time to 40 days each. The Legislature has 44 members in the Senate and 124 in the House. There are 7 Representatives in Congress.

History.—The first settlement in South Carolina was attempted in 1562 by a colony of French Protestant exiles, who named it Carolina in honor of their monarch, Charles IX., King of France. In 1663, Charles II., King of England, granted a charter to a company of English nobles, and under their auspices the first successful settlement was made at Port Royal, previously founded by the French. In 1680 the foundation of Charleston was laid. During the Revolution important battles occurred at Charleston, Fort Moultrie, Cowpens, Camden, King's Mountain, and Eutaw Springs. The State constitution was adopted in 1776, and the Constitution of the United States was ratified in 1788. South Carolina was the first State to secede from the Union, on Dec. 20, 1860. The first hostile act in the Civil War was the bombardment of Fort Sumter, in April, 1861. During the war the State suffered greatly, her harbors were blockaded, and much property was destroyed by the Federal soldiers on the great march under General Sherman. In 1865 the ordinance of secession was repealed and slavery abolished. A new constitution, establishing perfect equality between the white and the colored races, was voted in 1869; and in the same year the ratification of the 15th Amendment to the Constitution of the United States being carried by a vote of 18 to 1 in the Senate and 88 to 3 in the House, the State was readmitted to representation in Congress.

SOUTH CAROLINA, UNIVERSITY OF, a coëducational non-sectarian institution in Columbia, S. C.; founded in 1801; reported at the close of 1919; Professors and instructors, 37; students, 508; president, W. S. Carrell, LL.D.

SOUTH DAKOTA, a State in the North Central Division of the North American Union; bounded by North Dakota, Minnesota, Iowa, Nebraska, Wyoming, and Montana; admitted to the Union, Nov. 2, 1889; number of counties, 78; capital, Pierre; area, 76,850 square miles; pop. (1910) 583,888; (1920) 636,547.

Topography.—The surface of the E. portion of the State is a level plain, including the great plateau of the Missouri and a similar plateau E. of the James river. W. of the Missouri river the surface is broken, and contains the Black Hills, averaging 6,000 feet in height. This region covers an area of 3,200 square miles, and reaches its greatest altitude in Harney's Peak, 7,368 feet. The chief rivers in the E. section of the State are the Dakota or James, entering from North Dakota, and the Big Sioux, forming part of the E. boundary; both emptying into the Missouri river. W. of the Missouri and also emptying into it are the White, Cheyenne, Grand, and Moreau.

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100° E 99° F 98° G 97° H
Napoleon
Wishek
Kulm
Monango
Ashley
Ellendale
Lisbon
Cogswell
Oakes
Forman
Wahpeton
Hankinson
Lidgerwood
Fairmount
Whiterock
Claire City
Rosholt
Victor
Crawford
Hammer
Wheaton
Effington
Bosko
Otto
Sisseton
Brown Valley
Big Stone Lake
Corona
Wilmot
Summit
Bigstone City
Milbank
Twin Brooks
Stockholm
Albee
Revillo
Strasburg
Goodwin
Altamont
Bemis
Gary
Clear Lake
Brandt
Castlewood
Altamont
Dempster
Estelline
Toronto
Astoria
Lake Preston
Arlington
Bruce
White
Bushnell
Aurora
Elkton
Ward
Flandreau
Egan
Colman
Trent
Canova
Chester
Dell Rapids
Garretson
Sherman
Colton
Baltic
Lyons
Valley Springs
Renner
Brandon
Ellis
Harrisburg
Lennox
Canton
Worthing
Hurley
Davis
Hooker
Viborg
Fairview
Hudson
Centerville
Alcester
Dalesburg
Alson
Nora
Vermillion
Elkpoint
Jefferson
Ponca
Sioux
Laurel
Randolph
Wakefield
Wayne
Pierce
Neligh
O'Neill
Center
Bloomfield
Hartington
Plainview
Elkhorn R.
Niobrara R.
Missouri
Running Water
Springfield
Butte
Ponca Cr.
Keya Paha R.
Keya Paha
Winner
Dog Cr.
Ox Lodge Cr.
Bull Cr.
Medicine Butts
Red Butte
Oacoma
Chamberlain
Kimball
Pukwana
Reliance
Lyonville
Lower Brule
Crow Creek
Indian Reservation
Lower Brule Indian Reservation
Crowlake
Gordon
Glen
Vesta
Grosse
Lyman
Housan
Edna
Silvia
Roosevelt
Ola
Iona
Eagle
Bendon
Red Lake
Dunlap
Coyle
Bijou Hills
Academy
Chandler
New Holland
Harrison
Corsica
Platte
Dallas
Gregory
Herrick
Wheeler
Saint Elmo
Scalp
Ronesteel
Fairfax
Ft. Randall
Lake Andes
Wagner
Geddes
Armour
Delmont
Tripp
Scotland
Menno
Olivet
Wittenberg
Herok
Milltown
Corsica
Hillside
Clayton
Dolton
Monroe
Tea
Chandler
Harrisburg
Marion
Parker
Turner
Freeman
Parkston
Hutchinson
Hummer
Bridgewater
Emery
Canastota
Alexandria
Humboldt
Hartford
Sioux Falls
Minnehaha
Montrose
Salem
Spencer
Mc Cook
Lake Madison
Wentworth
Madison
Herman
Epiphany
Loomis
Mitchell
Mt. Vernon
Davison
Hanson
Aurora
Plankinton
Letcher
Beaver
Sanborn
Woonsocket
Forestburg
Artesian
Miner
Jerauld
Wessington Springs
Wessington Hills
Alpena
Parmelee
Virgil
Cavour
Huron
Beadle
Wolsey
Wessington
Miller
Highmore
Harrold
Holabird
Bonilla
Broadland
Lakeside
Wolsey
Yale
Oscelola
Manchester
Erwin
De Smet
Kingsbury
Mathews
Esmond
Drakoly
Thompson
Oldham
Ramona
Lake
Volga
Brookings
Hamlin
Willow Lake
Norden
Bryant
Castalia
Carpenter
Vienna
Haven
Hayti
Clark
Raymond
Garden City
Elrod
Naples
Grover
Henry
Kampeska
Cactus
Watertown
Codington
Grant
Deuel
Hamlin
Clark
Spink
Redfield
Frankfort
Doland
Irving
Crandon
Vanderhoof
Ladelle
Tulare
Turton
Bradley
Esterly
Helgen
Troy
Revillo
Faulk
Faulkton
Miranda
Zell
Rockham
Orient
Tennis
Dunsmore
Ellisville
Seneca
Getty Burg
Lebanon
Sutley
Hillsview
Martel
Leola
Delhi
Bowdle
Roscoe
Ipswich
Edmunds
Aberdeen
Bath
Plana
Ordway
Columbia
Hecla
Westport
Bern
Brown
Hecla
Andover
Lynno
Pickerel
Roslyn
Grenville
Pierpont
Langford
Frank
Sisseton
Agency
Loure
Veblen
Marion
Claire City
Victor
Rosholt
Milbank
Grant
Britton
Lake City
Marshall
Eden
Sunnyside
Spain
Claremont
Houghton
Amherst
Frederick
Detroit
Burch
Britton
Storm
Marshall
Eureka
Mc Pherson
Sutherland
Herreid
Mound City
Sutley
Tisio
Java
Bangor
Roscoe
Ipswich
Bowdle
Edmunds
Aberdeen
Albion
Rudolph
Warner
Mansfield
Gem
Ferney
Vernon
Bristol
Butler
Hotmquist
Webster
Waubay
Summit
Corona
Wilmot
Big Stone Lake
Java
Loyalton
Powell
Swan L.
Cr.
Hoven
Orlando
Pembroke
Springs
Millard
Cresbard
Roanoke
Northville
Mellette
Wesley
Athol
Ashton
Grobe
Conde
Lily
Chautauqua
Butler
Vernon
Bradley
Wallace
Strandburg
Dexter
Stroudsburg
Twin Brooks
Stockholm
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Faulk
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Spink
Redfield
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Codington
Watertown
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Hamlin
Castlewood
Clear Lake
Brandt
Altamont
Bemis
Gary
Goodwin
Strasburg
Lake Preston
Arlington
Bruce
White
Bushnell
Aurora
Elkton
Ward
Flandreau
Egan
Colman
Trent
Canova
Chester
Dell Rapids
Garretson
Sherman
Colton
Baltic
Lyons
Valley Springs
Renner
Brandon
Ellis
Harrisburg
Lennox
Canton
Worthing
Hurley
Davis
Hooker
Viborg
Fairview
Hudson
Centerville
Alcester
Dalesburg
Alson
Nora
Vermillion
Elkpoint
Jefferson
Ponca
Sioux
Laurel
Randolph
Wakefield
Wayne
Pierce
Neligh
O'Neill
Center
Bloomfield
Hartington
Plainview
Elkhorn R.
Niobrara R.
Missouri
Running Water
Springfield
Butte
Ponca Cr.
Keya Paha R.
Keya Paha
Winner
Dog Cr.
Ox Lodge Cr.
Bull Cr.
Medicine Butts
Red Butte
Oacoma
Chamberlain
Kimball
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Lower Brule
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Housan
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Iona
Eagle
Bendon
Red Lake
Dunlap
Coyle
Bijou Hills
Academy
Chandler
New Holland
Harrison
Corsica
Platte
Dallas
Gregory
Herrick
Wheeler
Saint Elmo
Scalp
Ronesteel
Fairfax
Ft. Randall
Lake Andes
Wagner
Geddes
Armour
Delmont
Tripp
Scotland
Menno
Olivet
Wittenberg
Herok
Milltown
Corsica
Hillside
Clayton
Dolton
Monroe
Tea
Chandler
Harrisburg
Marion
Parker
Turner
Freeman
Parkston
Hutchinson
Hummer
Bridgewater
Emery
Canastota
Alexandria
Humboldt
Hartford
Sioux Falls
Minnehaha
Montrose
Salem
Spencer
Mc Cook
Lake Madison
Wentworth
Madison
Herman
Epiphany
Loomis
Mitchell
Mt. Vernon
Davison
Hanson
Aurora
Plankinton
Letcher
Beaver
Sanborn
Woonsocket
Forestburg
Artesian
Miner
Jerauld
Wessington Springs
Wessington Hills
Alpena
Parmelee
Virgil
Cavour
Huron
Beadle
Wolsey
Wessington
Miller
Highmore
Harrold
Holabird
Bonilla
Broadland
Lakeside
Wolsey
Yale
Oscelola
Manchester
Erwin
De Smet
Kingsbury
Mathews
Esmond
Drakoly
Thompson
Oldham
Ramona
Lake
Volga
Brookings
Hamlin
Willow Lake
Norden
Bryant
Castalia
Carpenter
Vienna
Haven
Hayti
Clark
Raymond
Garden City
Elrod
Naples
Grover
Henry
Kampeska
Cactus
Watertown
Codington
Grant
Deuel
Hamlin
Clark
Spink
Redfield
Frankfort
Doland
Irving
Crandon
Vanderhoof
Ladelle
Tulare
Turton
Bradley
Esterly
Helgen
Troy
Revillo
Faulk
Faulkton
Miranda
Zell
Rockham
Orient
Tennis
Dunsmore
Ellisville
Seneca
Getty Burg
Lebanon
Sutley
Hillsview
Martel
Leola
Delhi
Bowdle
Roscoe
Ipswich

There are but few large lakes, Big Stone and Traverse, forming part of the N. E. boundary, being the only ones of any size.

Geology and Mineralogy.—The Black Hills, of Archæan formation, form the center of a system of concentric circles of geological ages. The Palæozoic surrounds the Archæan core, and consists of beds of Potsdam sand and Trenton lime. Around this is a circle of Jurassic and Triassic formations. The Miocene period covers the region W. of the Missouri and S. of the Bad river. The Black Hills contain some of the most valuable mineral deposits in the United States. Gold is the most important mineral production in the State. It comes almost entirely from the Black Hills. The production in 1919 was 254,820 ounces, valued at $5,267,600. Other mineral products include copper, lead, stone, and clay products.

Soil and Agriculture.—The soil is a light but rich loam overlying a fertile clay sub-soil, and is especially adapted to raising cereals. Wild fruits grow in great abundance, rich grass covers the prairies in the E. and Black Hills and Bad Lands afford excellent advantages for dairy farming and stock raising. The acreage, production, and value of the principal crops in 1919 was as follows: corn, 3,200,000 acres, production 91,200,000 bushels, value $108,528,000; oats, 1,850,000 acres, production, 53,650,000 bushels, value $33,800,000; barley, 875,000 acres, production, 19,250,000 bushels, value $22,138,000; wheat, 3,725,000 acres, production 30,175,000 bushels, value $72,420,000; rye, 500,000 acres, production 6,500,000 bushels, value $8,125,000; hay, 890,000 acres, production 1,558,000 tons, value $21,033,000; potatoes, 90,000 acres, production 4,500,000 bushels, value $8,550,000.

Manufactures.—There were in 1914 898 manufacturing establishments in the State, giving employment to 3,788 wage earners. The capital invested was $15,060,000, the amount paid in wages $2,628,000, the value of the materials used $17,080,000, and the value of the finished product $24,139,000.

Banking.—On Oct. 31, 1919, there were reported 126 National banks in operation, having $5,675,000 in capital; $4,109,000 in outstanding circulation; and $13,496,000 in United States bonds. There were also 519 State banks, with $10,038,000 capital.

Education.—Both elementary and secondary education are free to all persons from 6 to 21 years of age. Attendance between the ages of 8 and 16 at a public day school is compulsory. There were in 1918, 88,848 pupils enrolled in 5,296 elementary schools. The teachers numbered 5,493. There were 326 secondary schools, with 1,947 teachers and 49,637 pupils. The colleges include the University of South Dakota, at Vermilion; Agricultural College at Brookings; Augustana College, at Canton; Dakota University, at Mitchell; Yankton College, at Yankton; Huron College, at Huron; Redfield College, at Redfield; and Baptist College, at Sioux Falls.

Churches.—The strongest denominations in the State are the Roman Catholic; Lutheran, Independent Synod; Methodist Episcopal; Congregational; Lutheran, General Synod; Presbyterian; Regular Baptist; Lutheran, Synodical Conference; Protestant Episcopal; Reformed; and Evangelical Association.

Railroads.—The total length of railroads within the State on Jan. 1, 1920, was 4,300 miles.

Finances.—There was a balance in the treasury on July 1, 1918, of $3,144,924. The receipts for the fiscal year 1919 amounted to $7,937,044, and the disbursements to $7,441,146. The State has no bonded debt. The assessed value of real and personal property in 1919 was $1,846,456,090.

Charities and Corrections.—The charitable and correctional institutions under the control of the State include the Blind Asylum at Gary, School for Deaf Mutes at Sioux Falls, Penitentiary at Sioux Falls, Training School at Plankington, Hospital for the Insane at Yankton, Soldiers' Home at Hot Springs, School for Feeble Minded at Redfield, and Sanitarium for Tuberculosis at Custer. These institutions are under the control of the State Board of Charities and Corrections.

State Government.—The governor is elected for a term of two years. Legislative sessions are held biennially in odd years, beginning on the Tuesday after the first Monday in January, and are limited in time to 60 days each. The Legislature has 45 members in the Senate and 135 in the House. There are 3 Representatives in Congress.

History.—The country now known as the Dakotas was acquired by the United States as a part of the Louisiana Purchase. It was partly explored by Lewis and Clark in 1804 and 1806, by Frémont in 1839, and by Warner in 1855. The Territory of Dakota was created in 1861, and in 1868 Wyoming Territory was formed from part of its area. A scientific expedition, escorted by troops under General Custer, entered the Black Hills in 1874, and gave the first authentic information about the mineral wealth of that region. In 1883 a convention to frame a State constitution for Dakota met at Sioux Falls. Dissensions between

the people of the two sections of the Territory followed, and in 1888 it was decided to divide the territorial area into two States, under the names of North and South Dakota. The bill for their admission passed Congress and was signed by the President, Feb. 22, 1889. In 1890-1891 the "Indian Messiah" excitement led to troubles with the Sioux Indians, and in 1892 the Yankton Sioux ceded to the government a large part of their reservation between the Missouri and Choteau rivers.

SOUTH DAKOTA, UNIVERSITY OF, a coeducational non-sectarian institution in Vermilion, S. D., founded in 1883; reported at the close of 1919: Professors and instructors, 64; students, 825; president, R. L. Slagel, Ph.D.

SOUTHEND, an English watering-place, at the mouth of the Thames estuary; 42 miles E. of London. It has good level sands, a public hall, and piers, pleasure grounds, etc. It was bombarded by the Germans during the World War. Pop. about 75,000.

SOUTHERN ALPS, the name given to the Central and loftiest portion of the great dividing range of the S. Island of New Zealand. Many of the peaks are perpetually snow-capped, the highest being Mount Cook (13,200 feet). The glaciers of the southern Alps rival those of the Swiss Alps in magnitude, and on the W. side extend to within a few hundred feet of the sea-level.

SOUTHERN BAPTISTS, the name applied to that portion of the Baptist denomination in the southern half of the United States. Its communicants number more than half of the total number in the denomination. See BAPTISTS. The Southern Baptists' Convention has charge of the various activities of the body. These include mission boards, young people's societies, and Sunday schools. The convention supports about 1,400 missionaries.

SOUTHERN CALIFORNIA, UNIVERSITY OF, a coeducational institution in Los Angeles, Cal., founded in 1880 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 314; students, 4,375; president, George F. Bonard, A.M., D.D.

SOUTHERN CROSS, a constellation of the Southern Hemisphere, composed of four stars, one of which is of the first, and two of the second magnitude; they form an elongated figure, lying parallel to the horizon, nearly at the height of the pole. The largest of the four stars is the pole star of the S.

SOUTHEY, ROBERT, an English poet; born in Bristol, England, Aug. 12, 1774. Shortly after leaving Oxford he formed the acquaintance of Coleridge, the two friends marrying at the same time two sisters. After a short visit to Portugal, in 1796, he entered as a student of law at Gray's Inn. In 1801 he devoted himself to literature, and soon after took up his residence at Keswick, in Cumberland, where the remainder of his life was passed, he being thenceforth classed as one of the Lake poets. In 1807 he obtained a pension from the government, and on the death of Pye was appointed poet laureate. In 1839, two years after the death of his wife, he married Caroline Bowles. The latter years of his life were clouded by a mental imbecility which attended him to his death. His chief poems are: "Joan of Arc" (1796); "Thalaba" (1801); "Madoc" (1805); "The Curse of Kehama" (1810); "Roderick" (1814); "A Vision of Judgment" (1821); etc. Among his prose works are: "History of Brazil" (1810); "Life of Nelson" (1813); "Life of John Wesley" (1820); "History of the Peninsular War" (1823); "Sir Thomas More" (1829); "The Doctor" (1834-1837). Among his translations was "The Chronicle of the Cid." His "Commonplace Book," a posthumous publication in four volumes 8vo, is a marvelous monument of his reading and research. He died near Keswick, England, March 21, 1843.

SOUTH GEORGIA, a group of islands in the South Atlantic Ocean, uninhabited, and almost perpetually ice-bound; nearly 800 miles E. by S. of the Falkland Isles, of which they are a dependency; area, 1,000 square miles. Discovered in 1675, they were taken possession of by Captain Cook in 1775; and here in 1882-1883 lived the German expedition for observing the transit of Venus.

SOUTH HADLEY, a town in Massachusetts, in Hampshire co. It is on the Connecticut river. Its industries include the manufacture of writing paper, brick, cotton goods, lumber products, etc. It is the seat of Mount Holyoke College. Pop. (1910) 4,894; (1920) 5,527.

SOUTHINGTON, a town of Connecticut, in Hartford co. It is on the New York, New Haven, and Hartford railroad. The principal industries are the manufacture of hardware, tools, screws, etc. The town contains the borough of the same name. Pop. (1910) 6,516; (1920) 8,440.

SOUTH ISLAND, the lower of the two large islands which, with the small Stewart Island, form the British colony of New Zealand.

SOUTH KINGSTON, a town of Rhode Island, which includes West Kingston, the county-seat, and several other villages. It is on the New York, New Haven, and Hartford, and the Narragansett Pier railroads. It has manufactories of woolen and worsted goods. The village of Kingston is the seat of the Rhode Island College of Agriculture and Mechanic Arts. It is the center of an important farming region and has also extensive fishing interests. Pop. (1910) 5,176; (1920) 5,181.

SOUTH MILWAUKEE, a city of Wisconsin, in Milwaukee co. It is on the Chicago and Northwestern railroad. Its industries include the manufacture of steam shovels, dredges, mineral wool, veneers, electrical appliances, etc. Pop. (1910) 6,092; (1920) 7,598.

SOUTH MOUNTAIN, a ridge of the Alleghanies, near Middletown, Frederick co., Md.; the scene of a battle, Sept. 14, 1862, between the Union troops, under General Reno, composed of Reno's and Hooker's corps of General McClellan's army, and the Confederates, about 30,000 strong, under Generals Hills and Longstreet, in which, after a desperate struggle continuing throughout the day, the Union forces were victorious. General Reno was killed in the action.

SOUTH NORWALK, formerly a city of Connecticut, incorporated in 1913 with NORWALK (*q. v.*).

SOUTH ORANGE, a village of New Jersey, in Essex co. It is on the Delaware, Lackawanna and Western railroad. It is entirely a residential place and has many handsome private residences. It is the seat of Seton Hall College. Pop. (1910) 6,014; (1920) 7,274.

SOUTH PASADENA, a city of California, in Los Angeles co. It is on the Atchison, Topeka, and Santa Fé Coast Line, the Salt Lake Route, and the Pacific Electric and Southern Pacific railroads. It is the center of an important fruit-growing region and has large ostrich farms. Pop. (1910) 4,649; (1920) 7,652.

SOUTHPORT, a watering-place of Lancashire, England, incorporated in 1867; on the S. shore of the Ribble estuary, 18 miles N. of Liverpool. There are piers, bathing establishments, churches, a town hall, Cambridge Hall, the Atkinson Free Public Library and Art Gallery, etc. There are winter gardens with an aquarium; botanic gardens, covering upward of 20 acres, and containing a museum; and the Hesketh Public Park of 30 acres, with a meteorological institute. A small fishing village at the commencement of the 19th century, Southport is now a favorite winter resort for the surrounding manufacturing centers. Pop. about 55,000.

SOUTH PORTLAND, a city of Maine, in Cumberland co. It is on the Fore river and is opposite Portland, with which it is connected by a ferry and four bridges. Its industries include iron works, acid works, ship, railway, and machine shops, etc. It is the seat of the State School for Boys. Pop. (1910) 7,471; (1920) 9,254.

SOUTH RIVER, a borough of New Jersey, in Middlesex co. It is on the South river and on the Raritan River railroad. Its chief industries are the manufacture of bricks, clay products, and fire-proofing materials. Pop. (1910) 4,772; (1920) 6,596.

SOUTH SEA BUBBLE, a disastrous financial speculation which arose in England in the beginning of the 18th century. It originated with the directors of a joint-stock company, which, in consideration of certain exclusive privileges of trading to the South Seas, offered the government easier terms for the advance or negotiation of loans than could be obtained from the general public. In 1720 the proposal of the company to take over the entire national debt (at this time about $155,000,000) in consideration of receiving annually 5 per cent., was accepted, and the company promised in return for this privilege (as it was regarded) a premium in their own stock of $37,500,000. Professing to possess extensive sources of revenue, the directors held out promises to the public of paying as much as 60 per cent on their shares. It became soon apparent that such magnificent promises could never be fulfilled, and in a few months' time the collapse came which ruined thousands. The directors had been guilty of fraudulent dealings, and the chancellor of the exchequer and others in high positions were implicated.

SOUTH SAINT PAUL, a city of Minnesota, in Dakota co. It is on the Mississippi river, and on the Chicago Great Western, the Chicago, Rock Island and Pacific, and other railroads. It is the center of an important stock-raising region and has extensive meat-packing establishments, car foundries, tanneries, etc. Pop. (1910) 4,510; (1920) 6,860.

SOUTH SHETLANDS, a group of islands in the Antarctic Ocean, S. of South America, on the Antarctic circle; originally discovered by a Dutch seaman named Dirk Cherrits in 1599. The islands are uninhabited, and covered with snow the greater part of the year.

SOUTH VICTORIA LAND, or **VICTORIA LAND**, the eastern portion of the Victoria quadrant of Antarctic land. It is within the 160th and 170th meridian E. from about lat. 70° to beyond lat. 83° S. It is mountainous and covered with snow and contains the volcanoes Terror and Erebus. The Magnetic South Pole is near the northern extremity. Ross visited Victoria land in 1841, and knowledge covering it gradually increased till it was mapped in 1899 by Borchgrevink. Nordenskjöld, Scott, and Shackleton have more recently explored it.

SOUTHWARK, a metropolitan and parliamentary borough of central London (*q. v.*). Among its principal buildings are St. Saviour's Church, Guy's Hospital, Bethlehem Hospital for Lunatics, Leather and Borough markets, and the termini of the London, Brighton and South Coast railway and the Southeastern railway. The Surrey Commercial Docks and many manufactories of various kinds are in the borough. Pop. about 191,000.

SOUTHWELL, a town of Nottinghamshire, England, since 1884 a cathedral city, on the ancient Ermine street, 7 miles W. by S. of Newark. A church was founded here by Paulinus about 630; but the stately cruciform minster, which with its three towers resembles York on a smaller scale, is wholly of post-Conquest date. In the old "Saracen's Head" Charles I. surrendered to the Scotch commissioners (1646); Byron's mother occupied Burgage Manor House (1804-1807); and there are picturesque ruins of the palace of the Archbishops of York. Pop. about 4,000.

SOUTHWESTERN BAPTIST THEOLOGICAL SEMINARY, an educational institution in Louisville, Ky.; founded in 1859 under the auspices of the Baptist Church. Both men and women are admitted for instruction. The seminary in 1915 purchased a new site in the suburbs of Louisville. President, E. Y. Mullins, D.D., LL.D.

SOUTHWESTERN UNIVERSITY, a co-educational institution in Georgetown, Tex.; founded in 1873 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 27; students, 709; president, C. M. Bishop, A.M., D.D.

SOUTHWORTH, EMMA DOROTHY ELIZA NEVITTE, an American author; born in Washington, D. C., Dec. 26, 1819; was educated by her stepfather, J. L. Henshaw, at whose school she was graduated in 1835. She taught in a public school in Washington, D. C., in 1844-1849, and while so occupied began to write stories. Her first one, "The Irish Refugee," appeared in the Baltimore "Saturday Visitor." Subsequently she wrote for the "National Era," and in 1849 published the first of her serials, "Retribution," in that journal. Her novels, about 66 in number, include: "Gloria"; "Nearest and Dearest"; "An Exile's Bride"; "The Fatal Secret"; etc. She died in Washington, D. C., June 30, 1899.

SOUVESTRE, ÉMILE, a French author; born in Morlaix, France, April 15, 1806. He wrote: "The Last of the Bretons" (1835-1837); "The Breton Fireside" (1884); "A Philosopher under the Roofs" (1850) crowned by the Academy; "Historical and Literary Conversations" (1854); and various plays. He died in Paris, July 5, 1854.

SOVEREIGN, a gold coin, the standard of the English coinage. It equals 20 shillings sterling, and has a standard weight of 123.247 grains, being of 22 carats fineness, and coined at the rate of 1,869 sovereigns from 40 pounds troy of gold; worth at normal rate of exchange in United States money, $4.8665.

SOVEREIGNTY OF THE SEA. Blackstone lays it down that the main or high seas are part of the realm of England, as the courts of admiralty have jurisdiction there. But the law of nations, as now understood, recognizes no dominion in any one nation over the high seas, which are the highway of all nations and governed by the public law of the civilized world. Such a right has, however, long been claimed over the four seas surrounding the British Isles. It was strongly asserted by Selden and denied by Grotius, and measures were taken to vindicate the right in the reign of Charles I. The Dutch claimed the supremacy of the seas in Cromwell's time, but were worsted by Blake. Every nation has undoubtedly a right to the exclusive dominion of the sea within a certain distance from the shore, now fixed at 3 miles. This right of lordship includes the right to free navigation, to fishing, to taking wrecks, the forbidding passage to enemies, the right of flag, of jurisdiction, etc. By the law of England the main sea begins at low-water mark; and between low and high water mark the common law and admiralty have a divided jurisdiction, one on land when left dry, the other on the water when it is full sea.

SOVIET. The name given to the Soldiers' and Workingmen's Council, established in Russia, following the overthrow of the provisional government erected by the revolution of 1917. See COUNCIL OF WORKINGMEN AND SOLDIERS; RUSSIA; LENINE; NIKOLAI; WORLD WAR.